



Euro-Mediterranean
CONFERENCE 2012
on Research and Innovation

AN AGENDA FOR
A RENEWED PARTNERSHIP

Report on the Euro-Mediterranean Conference on Research and Innovation

Barcelona, 2-3 April 2012

CONSOLIDATED REPORT

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and input made by the participants of the conference

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EXECUTIVE SUMMARY

In 2011, in response to the rapid transformations taking place in the Arab countries, the European Commission identified and confirmed the EU's neighbourhood countries as a key priority and developed a new strategy for the Mediterranean region. Research and innovation (R&I) offer significant opportunities for Mediterranean countries to develop and exploit their assets for the benefit of their economies and of their peoples, as drivers of economic and social development. Increased knowledge and R&I are keys to the successful deployment of specific products, processes, technologies and concepts which, in turn, may deliver economic, environmental and social benefits on a wider scale. The development of a Common Knowledge and Innovation Space and the EU's Innovation Agenda are two central aims of the Union's new strategy. In this spirit, the Euro-Mediterranean Conference on Research and Innovation was held in Barcelona on 2-3 April 2012, to bring together researchers, practitioners, policy-makers and legislators.

Five thematic areas (water, energy, health, transport and the marine environment) and four cross-cutting issues (strengthening innovation, science in a changing society, building capacities, and coordination of initiatives) were chosen for discussion, reflecting both the common challenges facing our societies and the key issues raised by the transition to a multipolar world.

Special emphasis was placed by the participants of the conference on addressing urgent societal and economic issues in the Euro-Mediterranean region as effectively as possible; and on helping to transform the Mediterranean area into a zone for sustainable economic and cultural exchanges based on common research and innovation efforts, that benefit its inhabitants. The time frame for the new strategy and related projects and initiatives to deliver results is much shorter –given the pace of socio-economic change in the area, as well as the pace of science and technology development- than is generally assumed and that has been the case until now in research and knowledge-related capacity-building.

The main conclusions of the conference are the following:

- There was overwhelming agreement that European and Mediterranean countries need to work together and promote a bi-regional partnership to address the challenges we face.
- The renewed partnership in Research and Innovation should be based on the principles of co-ownership, mutual interest and shared benefit.
- The cooperation agenda should cover the whole chain from research to innovation, mobilising universities, research centres and industry, and extending to organisations that provide support services, such as financial institutions and investors.
- There is a need to reform, modernise and strengthen R&I capacities and systems: investment in R&I should be recognised as a priority in national economic policy.
- The partnership should involve the EU, national and regional authorities in EU Member States and the Southern Mediterranean countries.
- The partnership should be expanded to include scientists and public and private research institutions as well as research- and innovation-driven enterprises.
- The cooperation needs to move away from bilateral approaches to a “region-to-region” approach and, as such, adopt a more strategic perspective which will allow to build scale and scope.
- The European Commission and the European External Action Service will support this new partnership and prepare the way for even more substantial cooperation in the future, involving all EU Member States and Mediterranean countries.

- DG Research and Innovation will launch calls for proposals in July 2012 to support the implementation of the partnership. These calls will include some dedicated actions, with a budget of around EUR 40 million, covering areas of specific mutual interest for the EU and the Mediterranean region such as agriculture, health, renewable energy, environment, transport, technology, entrepreneurship and higher education to bridge the gap between research and innovation, and opportunities for exchanges of researchers.
- DG Research and Innovation will also launch a specific ERA-NET/ERA-NET PLUS action, which will contribute to the preparation of a long-lasting and sustainable coordination mechanism between the EU, its Member States and the Mediterranean countries, such as an Article 185 initiative for the Mediterranean.

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1. INTRODUCTION

The historical changes taking place in the Southern Mediterranean region call for a focused, innovative and ambitious response from the European Union. In 2011, the European Commission identified and confirmed the EU's neighbourhood countries as a key priority and developed a new strategy for the region¹.

Today, academics and practitioners alike acknowledge the major role that research and innovation play in promoting job creation, inclusive growth and sustainable economic development. Research is an important ingredient and determinant of the innovation process. Innovation always needs new knowledge based on the outcome of research.

Research and innovation (R&I) offer significant opportunities for Mediterranean countries to develop and exploit their assets for the benefit of their economies and of their peoples, especially as drivers of economic development. Increased knowledge and R&I are keys to the successful deployment of specific solutions which, in turn, may deliver economic benefits on a wider scale. Issues relating to the transfer of knowledge acquired in the Mediterranean area to market should also be targeted with specific support, and the creation of favourable and stable conditions for innovation, including ensuring the availability of the skills needed for the successful deployment of new technologies.

The development of a Common Knowledge and Innovation Space and the EU's Innovation Agenda are two central aims of the Union's new strategy. The successful implementation of this ambitious strategy and the delivery of sustainable results depend on coordinated action and streamlined activities aimed at building a common innovation- and research-based culture. This may include policy dialogue, national and regional capacity-building, cooperation in research and innovation, increased mobility opportunities for students, researchers and academics, and strong links between business, research and academia, including for facilitating the transfer of innovations to market.

In this spirit, the Euro-Mediterranean Conference on Research and Innovation was organised by the European Commission's Directorate-General for Research and Innovation (DG RTD) in consultation with other DGs, the European External Action Service, the European Parliament, EU Member States and the Mediterranean countries, and held in Barcelona on 2-3 April 2012, to bring together researchers from a variety of disciplines (natural sciences, engineering, social sciences), policy-makers (at local, national and EU level), legislators (namely European Parliament) and others in order to:

- identify and share experiences gained from past and on-going initiatives in the sphere of research and innovation (R&I);
- identify key societal challenges and structural reforms to be tackled in the region;
- define the objectives and main elements of a medium- to long-term agenda for Euro-Mediterranean cooperation in R&I, as well as priority areas of cooperation in the years to come;
- promote a process of coordination between the policies and programmes of the EU, EU Member States and Mediterranean countries, with the aim of enhancing the scientific capacities of Mediterranean countries, increasing the impact and coherence of initiatives in the region, and underlining the values of mutual respect, reciprocity and partnership;
- increase the impact of on-going cooperation activities by the EU and EU Member States by promoting networking, scientific capacity-building, researchers' mobility, synergies and the exploitation of results, including the commercial take-up of innovations.

¹ Additional information can be found in the Joint Communications of the European Commission and the High Representative of the Union for Foreign Affairs and Security Policy ([COM \(2011\) 200](#) and [COM \(2011\) 303](#)).

Five thematic areas (water, energy, health, transport and the marine environment) and four cross-cutting issues (strengthening innovation, science in a changing society, building capacities, and coordination of initiatives) were identified, reflecting the common challenges facing our societies. These topics and issues were chosen not only because of their central role in meeting the requirements for sustainable economic development, societal well-being and the competitiveness of the Mediterranean rim economies, but also because of their significant potential to stimulate excellent research and acquire knowledge of global relevance.

Special emphasis was placed throughout the conference on addressing urgent societal and economic issues in the Euro-Mediterranean region as effectively as possible; and on helping to transform the Mediterranean area into a zone for sustainable economic and cultural exchanges that benefit its inhabitants. The time frame for the new strategy and related projects and initiatives to deliver results is much shorter –given the pace of change in the region as well as the pace of technology and scientific developments- than is generally assumed and that has been the case until now in (basic) research and knowledge-related capacity-building.

Achieving these goals requires a policy framework that fosters trans-border and multidisciplinary initiatives, excellence, and significant capacity to contribute to upgrading the innovation chain, while at the same time taking into account the current imbalance in development between north and south, and east and west.

2. CONFERENCE PROGRAMME²

The conference brought together more than 300 participants from over 30 countries, including high-level scientists, representatives of research organisations in EU Member States and Mediterranean countries, funding agencies, financial institutions, EU institutions, the Secretariat of the Union for the Mediterranean, national and regional authorities, and R&I project coordinators.

It was opened by Mrs. Máire Geoghegan-Quinn, European Commissioner for Research, Innovation and Science, who stressed that we need to tackle issues of common interest jointly and to bring our scientists together so they can find the answers we need, and argued that there is also a strong economic rationale to work together across the region. She was followed by Mrs. Carmen Vela Olmo, State Secretary for Research and Innovation Spain, who emphasised the significant role for research and innovation in the Euro-Mediterranean partnership and insisted that the economic crisis was no excuse for failing to act. Mr. Andreu Mas-Colell, Minister for Economy and Knowledge in Catalonia, outlined the positive impact of sound policy-making. Mr. Lahcen Daoudi, Minister of Higher Education, Scientific Research and Training in Morocco, highlighted the importance of science and universities for socio-economic development following the events of the Arab Spring and said Morocco intended to engage actively in Horizon 2020. Mr. Kim Brinckmann, Head of Division at the Center for Globalisation, Danish Agency for Science, Technology and Innovation, representing the Danish EU Presidency, outlined the timeline for follow-up conferences and initiatives, and emphasised the strong focus on R&I and the efforts being made by Denmark and Cyprus to enhance cooperation in these areas. The last speaker in this session, Mr. Kent Johansson MEP, suggested areas where lessons can be learned from past experience, especially the EU Structural Funds and Baltic Sea cooperation.

The plenary session was followed by a round table discussion on the key role that R&I cooperation can and should play in the renewed Euro-Mediterranean partnership, and the key principles that should underpin this. The panel included Mr. Maged Al-Sherbiny, President of the Academy of Scientific Research and Technology, Egypt; Mr. Mats Karlsson, Director of the Centre for Mediterranean Integration (CMI); Mr. Mahmoud El-Sohl, Director General of the International Centre for Agricultural Research in the Dry Areas (ICARDA), Syria; Mr. Nichi Vendola, President of Regione Puglia and Member of the Euro-Mediterranean Regional and Local Assembly (ARLEM), Italy; Mr. Michel Laurent, President of the Institute of Research for Development (IRD), France; and Mr. Khaled Toukan, Chairman of the Jordan Atomic Energy Commission.

The key conclusions of this discussion were that co-construction and co-ownership of the medium- to long-term agenda for enhanced cooperation are essential, as are co-funding of projects and co-evaluation of the results. Speakers also agreed that coordination of activities needed to be strengthened to maximise the impact and mutual benefits of enhanced cooperation.

Following this debate, participants split into smaller groups for five thematic and then four parallel sessions on cross-cutting issues. A short summary of each session is presented in the next section.

The second day of the conference was opened by Ms Maria Damanaki, European Commissioner for Fisheries and Maritime Affairs, who highlighted areas of cooperation between the EU and the Mediterranean countries, and emphasised the need for sufficient and appropriate data for informed decision-making. She was followed by Ms Ayala Sender MEP, who presented the work of the Parliamentary Assembly of the Union for the Mediterranean.

In the next plenary session, participants heard brief reports on the outcomes of the parallel sessions, which focused on identifying the most important issues to be addressed, the main challenges and key next steps to

² Details can be found in http://ec.europa.eu/research/conferences/2012/euro-mediterranean/index_en.cfm

ensure enhanced cooperation delivers significant progress and maximum mutual benefit. The results were then discussed to identify common challenges and priorities for action.

The final session began with a speech by Mr Stavros Malas, Cypriot Minister for Health, who outlined his country's priorities for its EU Presidency in the second half of 2012. He was followed by Mr Ilan Chet, Deputy Secretary General of the Union for the Mediterranean, who focused on the achievements and lessons of past and ongoing projects, and Mr Pierre Deusy of the European External Action Service, who spoke about international cooperation through the European Neighbourhood Policy instruments on behalf of Christian Berger.

In closing remarks, Mr Robert-Jan Smits, the Commission's Director-General for Research and Innovation, welcomed the optimistic spirit of the conference, stressed the Commission's commitment to maintain the momentum, underlined the urgent need for political commitment on all sides to drive the process forward, and announced a number of follow-up steps.

3. ORGANISATION AND DESCRIPTION OF THE PARALLEL SESSIONS

Each parallel session, either thematic or transverse, grouped six panellists and was organized around three specific topics chosen beforehand. After a general introduction to the theme by the chair on the basis of an input paper, three speakers were invited to give their views on the main objectives relating to the specific topics and how best to address them. Complementary views on technical challenges or on national policies could be brought out by other panellists. The chair and rapporteur then animated a debate between a panel of high-level experts and with the audience. Each session closed with a summary of the outcome of the discussions by the rapporteur, who also presented them during the plenary session on the afternoon of the second day. (Related documents can be found on the Conference Web site, see note ²)

The reports back to the plenary were delivered in a standardised format to allow for a direct comparison of the outcomes, in order to identify common issues and challenges. To this end, each session was asked to address three main questions:

- What are the most important issues to *focus* on in the area under discussion; i.e. the main elements of a medium- to long-term agenda for Euro-Mediterranean R&I cooperation?
- What are the main *challenges* to be addressed to build an effective partnership in this area?
- What are the *priorities* for action (i.e. the key next steps) to ensure the renewed partnership delivers significant progress in this area?

The aim was not to reach agreed conclusions, but rather to highlight the key points made by participants in areas where there appeared to be a significant degree of convergence in views.

3.1. Parallel session 1: Water availability and management

The debate addressed three closely related *topics*:

- Water scarcity and management under climate change.
- Ensuring sustainable access to limited water resources.
- Water use in agriculture: inter-linkages between lands and water use, cultural heritage and behaviour.

Participants identified the following issues as the most important ones to *focus* on:

- Developing capacities in risk assessment, planning and adaptation through adequate good governance, stakeholders and societal engagement;
- Good governance to ensure equity in water allocation, sustainable water management and institutional reinforcement –also considering the impacts of climate change;
- Holistic but competitive research and innovation in water quantity management and use efficiency, and management of non-conventional waters (e.g. waters generated through desalinization, harvesting of rainwater, etc.).

The main *challenges* to be addressed are:

- Ensuring water management for all ecosystem functions and food security - political willingness is required to ensure a multi-sector and multi-scale approach;
- Strengthening civil society and water users' empowerment, improving dialogue and mutual trust among institutions, researchers and society;
- Building regional co-ownership of water resources management, from identifying challenges to financial and implementation synergies.

The *priorities* for action and key next steps should be:

- Adopting the Mediterranean Water Strategy and Action Plan, which will provide the financial and instrumental framework for the future;
- Partnerships to create the conditions for competitive research in water use efficiency, use of non-conventional waters, risk management;
- Regional joint funding for trans-basin cooperation and regional water innovation programmes.

3.2. Parallel session 2: Renewable energy and efficiency

The debate addressed the following topics and identified the main focus, challenges and priorities.

Topics:

- Integration of renewable energies and grid developments: technology challenges.
- A vision for a common Mediterranean R&I strategy for renewable energy.
- Energy innovation to supply domestic markets and for export.

Focus:

- Renewable energies (RE) & energy efficiency (EE) will play a central role in the sustainable development of the Mediterranean rim. EE deployment, in particular, should start now (esp. in built environment),
- Favour specific technological R & I initiatives, including investments in concrete projects, measures to accelerate the deployment of new technologies and the creation of a Mediterranean new energy market (*besides hydrocarbons*) over the short, medium and long term,
- Create and consolidate framework conditions – e.g. human capital, policies (*IPR, standards, investments warranty, governance ...*), risk capital and financing to enable and foster collaboration in energy R & I, the development of technological energy companies and the establishment of Mediterranean joint ventures.

Challenges:

- Focus on and develop RE & EE technologies and innovative approaches best adapted to the Mediterranean rim's resources & assets (*sun, wind*); the integration of RE into electricity grids and the needs of each of its regions, including the islands (*energy production, fresh & industrial water, economic and social life, tourism...*);
- R & I in RE & EE should support the current needs of industry and society while preparing for the evolution to an energy market in which RE will play a much more significant role, in synergy with the Mediterranean Solar Plan;
- Favour R & I collaboration (*esp. between public and private actors*) and joint investment in energy by adapting national R & I policies as well as bi- or multi-lateral R & I policies;
- Integrate energy R & I in a general Mediterranean policy with clear and administratively-light governance rules.

Priorities:

- Focus R & I collaboration in RE & EE on specific, focused and long-term regional world-class Joint Technology and Innovation Programmes (*solar, wind, energy storage, energy efficiency, integrated poly-generation/poly-uses systems, multi-scale smart grids*). A specific attention should be put on coordinated plans for Research Infrastructures and demonstrators.
Deployment of innovative EE & RE technologies by favouring the development of technology companies; innovative practices (mainly in EE); joint investments in innovation; the provision of risk capital; and the development of local professional skills (*including technicians for deployment and maintenance*). Alliances in research and business should be facilitated as well as joint financing and professional education.
- Insert a Mediterranean element into EU energy R & I policies and innovative investments (*education and mobility programmes - in & out-going to combat brain-drain -; SET Plan -EII,*

European Energy Research Alliance (EERA), Education & training, Strategic Energy Technologies Information System (SETIS); H2020, European Institute of Innovation and Technology (EIT) and Knowledge and Innovation Communities (KICs) (esp. InnoEnergy), European Science Infrastructure Initiative (ESFRI) Energy group, Risk Sharing Facility Fund (RSFF) & European Investment Bank, etc.

- Monitoring, evaluation and re-adjustment are mandatory for ensuring efficiency of the renewal process. In particular, a Mediterranean Energy Congress should be organised every two years.

3.3. Parallel session 3: Fighting diseases and improving well-being

The debate addressed the following topics and identified the main focus, challenges and priorities.

Topics:

- Rare diseases.
- Non-communicable diseases, diabetes, obesity :
- Health in a changing environment.

Focus:

- Develop common scientific interest in rare diseases, non-communicable diseases and potential problems stemming from rapid changes; also in many other fields;
- Health in a changing environment: emerging infectious diseases (EID) are a representative example and model of health issues in a changing environment. Scientific evidence suggests EIDs are linked to trends related to the climate, pest and wildlife ecology, animal husbandry, social structures and the movement of people, foods and livestock;
- Stimulate science through diversity analysis: regional and ethnic usefulness for epidemiology or genetic diagnosis.

Challenges:

- Overcome difficulties linked to limited continuity in partnerships: focus on programmes rather than projects; better careers for scientists; continuity in institutional contact persons;
- Get to know each other better, joint identification of collaboration priorities;
- Public health and health services research as drivers for collaboration.

Priorities:

- Create a forum to develop interaction between scientists;
- Establish sustainable partnerships between research/public health institutions
- Establish a structure for Euro-Med partnership governance at research, policy-making and set adequate funding levels.

3.4. Parallel session 4: Green, efficient and integrated transport systems

The debate addressed the following topics and identified the main focus, challenges and priorities.

Topics and focus:

- Competitive green ports and hinterland connectivity.
- Transport networks and logistics networks.
- City development and urban mobility.

Challenges:

- Different local needs and mobility habits in the various countries/regions → acceptability is a prerequisite for sustainability;
- Fragmented responsibilities at institutional level → slow decision-making;
- High costs of logistics (up to 20% of GDP), particularly in the last mile → ports and cities need an integrated approach.

Priorities:

- Integrated joint programming covering R&D, cooperation, capacity building, pre-deployment and training (e.g. R&D+ ENPI+TEN-T)
- Focus more on demonstrators and pre-deployment activities, e.g. Mediterranean Motorways of the Seas;
- Develop suitable instruments for regional cooperation South-North-South (North= facilitator), allowing research into transport policy implementation.

3.5. Parallel session 5: Management of marine environment and resources

The debate addressed the following topics and identified the main focus, challenges and priorities.

Topics:

- Mediterranean Sea environment: challenges & opportunities.
- Pressures in the Mediterranean Sea environment.
- An ecosystem-based approach for fisheries and aquaculture.

Focus:

- Biodiversity variability at different scales, habitat studies for good environmental status (GES) assessment, habitat mapping;
- Hotspots: natural and anthropogenic pressures (incl. sea-based); aquaculture positive impact;
- Time series, long term monitoring, physical, biogeochemical and socio-economic indicators, integrated monitoring capabilities, scenarios; acquire new knowledge through Mediterranean Sea Basins for Knowledge-based policy-making, new research topics to support economy and innovation.

Challenges:

- Data gaps, data availability, question marks over reliability and fragmentation, esp. for GES descriptors, Marine Strategy Framework Directive (MSFD), Water Information System for Europe (WISE-Marine), European Marine Observation and Data Network (EMODnet + INSPIRE), Initiative for the depollution of the Mediterranean Sea (one of the 6 priorities of the Union for Mediterranean) linked to green economy for jobs and growth;
- Shortage of expertise; training in new technologies and infrastructure and multi-disciplinary topics is crucial;
- More in-depth coordination at different levels for establishing environmental and ecosystem variability, ecosystem approach and integrated maritime policy; regional ownership and cooperation for achieving GES; mechanisms for cooperation.

Priorities:

- Integrated and sustained monitoring and reporting systems (incl. physical and biogeochemical elements, pressures/impacts of pollution from land and sea-based activities) for coasts and seas in Mediterranean partner countries by regional bodies/programmes; free and quality controlled data, ecosystem inventory of services and their value;
- Socio-economic issues as research subjects;
- Enhanced network of governance with users and all countries to exchange data and processes of investigation; identify Mediterranean partner country priorities.

3.6. Parallel session 6: Strengthening innovation in the Mediterranean region

The debate addressed the following topics and identified the main focus, challenges and priorities.

Topics:

- Enhancing cooperation between public research organisations and industry.
- Networking initiatives to develop innovation in the Mediterranean region.
- Financing facilities to strengthen the innovation chain.

Focus:

- Provide a strong and visible sign of European policy commitment towards the Mediterranean Countries area within the Horizon 2020 programme in order to account for the present sense of urgency
- Strengthen R&I cooperation by:
 - Bringing R&I closer together and aligning existing programmes and initiatives at the level of the EU, the Euro-Mediterranean relations, and of Mediterranean countries;
 - Unleashing the innovative potential in the MED region and make direct use of R&I for socio-economic development in the region in the medium and long term;
 - Focusing research and cooperation on strengthening innovation and marketable knowledge in the Mediterranean region;
- Make Euro-Mediterranean cooperation a top innovation policy priority within H2020, with knowledge-based economic development in the Euro-Med and job creation through innovation and entrepreneurship a subsequent top priority.

Challenges:

- Increase the socio-economic impact of past research and innovation projects;
- Reduce complexity through a coordinated innovation policy from European Institutions (EC, EIB, ERDB, EIT);
- Bring R&I together through enhanced networking facilities;
- Develop a strategic perspective and coordinated action, directly involving stakeholders, which is the key to future success. This in return requires informed decision-making based on detailed knowledge and understanding of the real needs at local and national level.

Priorities:

- A special budget line for R&I in the 2020 Euro-Med cooperation
 - Launch of Joint R&D and Innovation Calls for tenders involving local Government or Regional co-financing
 - Financing flag-ship R&D and collaborative projects involving the scientific excellence from South Mediterranean Countries in topics and key research challenges requiring local expertise (such as climate change, renewable energy, new growth sources, diversification of energy sources, agricultural crops and/or transport means).
- Support in R&D Policy design: new financial schemes, analysis of the demand, reliable data collection, impact evaluation
 - Systematic collection of data on appropriate innovation and technology indicators to support innovation and the take-up of innovative products
 - Focus on young entrepreneurs and researchers' training, coordinated public-private action and multilateral flagships projects.
- Reinforce the inter-institutional among the operational leading EC players in the area like the EC and the EIB Delegations .

3.7. Parallel session 7: Changing science in a changing society

The debate addressed the following topics and identified the main focus, challenges and priorities.

Topics:

- Changing science: a new way of doing science in the context of the Mediterranean region.
- New generation of researchers: role and promotion of young people and women.
- The role of science in a transitional society: drivers of change.

Focus:

- Science to the service of economy and society;
- Address the under-estimation of the role of social and human sciences –which are needed to understand socio-economic change;
- Need to reintegrate science in the broader cultural landscape and debate to overcome perceptions of cleavage between science, economy and society.

Challenges

- Scope: need to act holistically –starting from basic education, to include the full cycle of research, innovation, and the identification of their impacts on economy and society;
- Consider common Mediterranean issues, but act on project-scale problems, delivering on visible results and linking to daily life, fostering co-ownership and co-design;
- Procedures: need to account for diverging viewpoints and allow for pluralism and competition of ideas, need for bilateral/biregional coordination and EU facilitating role to implement it; need to overcome institutional silos and inertia to foster demand-driven research and innovation and co-ownership

Priorities:

- Need for visibility and clear budget and strategy for science and research for Euro-Med priorities;
- Apply good practices in funding science/society cooperation (a hidden treasure) plus monitoring and evaluation;
- Capacity- and empowerment-building (transformative networks, change agents' coalitions, learning by doing, etc.)

3.8. Parallel session 8: Coordination of research and innovation programmes and funding instruments

The debate addressed the following topics and identified the main focus, challenges and priorities.

Topics and focus:

- Optimising the use of programmes and funding instruments covering the R&I chain.
- Coordination and synergies between bilateral programmes.
- Towards a regional programme for research and innovation.

Challenges:

- Science cannot ignore societal changes and challenges on both sides of the Mediterranean; crises are also opportunities to promote better use of resources, including knowledge;
- Make use of the existing results of science, technology and products to address societal and economic challenges, create an innovation-driven culture and identify where industry's interests lie;
- Pass from usual fragmented cooperation to full partnership between EU and the MPCs (regulations, institutional building, etc.)
- Facilitate the uptake of knowledge by industry and shorten the gap between research and market.

Priorities:

- New funding perspectives should follow a scheme similar to the Africa Plan, identifying key sectors for co-development and targeting common benefits;
- Support a bi-regional programme of research, innovation and higher education, with full co-design, co-evaluation, co-management, co-appropriation and co-funding. Construct medium- to long-term Research Agendas focused on a few challenges of common interest;
- Create a common legal structure that could act as a facilitator of partnership, shared property of results and mobilizing of resources.

3.9. Parallel session 9: Building competence for Research and Innovation: governance, human capital and research infrastructure

The debate addressed the following topics and identified the main focus, challenges and priorities.

Topics:

- Enhancing R&I policies in the Mediterranean region (governance frameworks, institutional reforms).
- Human resources, training and mobility, including diasporas.
- Research and innovation infrastructures.

Focus:

- Innovation encompassing all sectors and themes and including social sciences and humanities is vital for prosperity and wellbeing over the Mediterranean rim;
- Capacity-building: need to foster new ways of educating and training towards non-traditional ways of thinking;
- Large Euro-Med R&I projects as a means to achieve prosperity via integrated cooperation.

Challenges:

- Develop equal partnership and common long-term targets with emphasis on inter/intra-regional cooperation;
- Involve the private sector and NGOs at all levels;
- Create a suitable and simple governance framework to facilitate the emergence of much-needed synergies and enhance the efficiency of Euro-Med activities.

Priorities

- Call for a follow-up of the 2007 Cairo Inter-ministerial Conference (Priority to the establishment of a Euro-Med Higher Education System and a Euro-Med Research Area) with the involvement of the private sector;
- Harmonise/align the overall legislative framework, especially for IPR;
- Progressively initiate a suitable governance framework and action plan to enhance innovation at the national, regional and Euro-Med levels for the well-being of the Euro-Med community and humanity as a whole.

4. CONCLUSIONS

The main conclusions of the conference were as follows:

- There was overwhelming agreement that European and Mediterranean countries need to work together and promote a bi-regional partnership to address the challenges we face.
- The renewed partnership in Research and Innovation should be based on the principles of co-ownership, mutual interest and shared benefit.
- The cooperation agenda should cover the whole chain from research to innovation, mobilising universities, research centres and industry, and extending to organisations that provide support services, such as financial institutions and investors.
- There is a need to reform, modernise and strengthen R&I capacities and systems: investment in R&I should be recognised as a priority in national economic policy.
- The partnership should involve the EU, national and regional authorities in EU Member States and the Southern Mediterranean countries.
- The partnership should be expanded to include scientists and public and private research institutions as well as research- and innovation-driven enterprises.
- The cooperation needs to move away from bilateral approaches to a “region-to-region” approach and, as such, adopt a more strategic perspective which will allow to build scale and scope.
- The European Commission and the European External Action Service will support this new partnership and prepare the way for even more substantial cooperation in the future, involving all EU Member States and Mediterranean countries. DG Research and Innovation will launch calls for proposals in July 2012 to support the implementation of the partnership. These calls will include some dedicated actions, with a budget of around EUR 40 million, covering areas of specific mutual interest for the EU and the Mediterranean region such as agriculture, health, renewable energy, environment, transport, technology, entrepreneurship and higher education to bridge the gap between research and innovation, and opportunities for exchanges of researchers.
- DG Research and Innovation will also launch a specific ERA-NET/ERA-NET PLUS action, which will contribute to the preparation of a long-lasting and sustainable coordination mechanism between the EU, its Member States and the Mediterranean countries, such as an Article 185 initiative for the Mediterranean.

WORKING PAPERS

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Parallel session 1: Water availability and management**Authors:** Claudio Bogliotti, Cosimo Lacirignola, Mahmoud Abu-Zeid, Michael Scoullas, Nicola Lamaddalena, Latifa Boussemi.**1) Proposed topics to be covered**

1. *Water scarcity and management under climate change*
2. *Ensuring sustainable access to limited water resource*
3. *Water use in agriculture: interlinks between lands and water use – cultural heritage and behaviour*

2) State of play

Water availability is a prerequisite for the sustainable development of the Mediterranean region, and the three main topics identified for the “*water*” session are subject to research and debates while strictly interconnected each with another. Major problems with fresh water resources management in the region arise from the pressure to meet the food demand, domestic needs in urban and rural areas, industrial and energy needs of a fast-growing population as well as from climate change. The region as a whole is undergoing rapid social, economic, environmental and political changes which may have implications for sustainable development. This is particularly true for the water sector where pressures and impacts on water are likely to be exacerbated leading to increased risk of water scarcity under climate change. Water scarcity often results in a non-equitable access to resources, sanitation problems (a substantial number of inhabitants does not have adequate access to clean water and sanitation, particularly in the rural areas) and consequent conflicts among the users.

Given the above concerns, there is no doubt that for the Mediterranean region the integrated approach to manage limited water resources in a sustainable way has to be an essential requirement for the development and a main policy concern. Though certain progress has been made on policy development towards integrated approaches, implementation faces substantial challenges. Creative new policies, realistic action plans, visionary legislation as well as functional enforcement and implementation mechanisms (with the necessary resources attached) need to be carefully developed to achieve application of integrated water resources management that will address both the needs of populations and ecosystems, particularly under conditions of climate variability and change. Regarding climate, the reality of climate changes renders it obsolete, very risky or extremely difficult – if at all possible - to use the past as an indicator for the future, thus we need to develop policies and a system of governance easy to adapt to changes and unpredictable perturbations while improving a societal shared knowledge base on climate variability and change and related water risks. The low reliability of supply services and infrastructures are also important constraints to sustainable water management in many Mediterranean countries.

The major challenge facing water managers, water planners and decision makers is that while water yields of southern Mediterranean countries are constantly or dramatically reducing, demand for water increases steadily for the different uses. This causes emerging water conflicts are encountered between cities, countries and different types of users such as agriculture, urban areas, industry, tourism as well as ecosystem. There is an increasing need of multi and inter-disciplinary and comprehensive approach to enhance “integrated” and sustainable water management, which takes into account simultaneously all the constraints described above and insert them rationally in a sufficiently long-term socio-economic and environmental-climate scenario.

Management of limited water resources has taken many different forms and directions throughout the Mediterranean region. Researchers, managers and decision makers have long sought ways of capturing, storing, re-cycling and redirecting water resources in efforts to reduce their vulnerability to irregular river flows and unpredictable rain patterns and droughts. Early agriculture based society lead to a certain concentration of efforts in “agricultural” water management, while the growing urbanisation is requiring

new advances in the science of civil engineering and hydrology as water supplies had often to be brought from long distances or extracted from the sea by expensive desalination techniques or obtained through recycling waste waters. Nevertheless the dynamic process of managing water resources and demand is gradually changing. There are many components to this change: a shift away from sole reliance on finding new sources of supply to address perceived new demand; a growing awareness on the importance of preventing and mitigating water conflicts; a growing emphasis on incorporating ecological values into water policy; a re-emphasis on meeting basic human needs for water services; and a conscious breaking of the ties between economic growth and water use. A reliance on technical solutions continues to dominate traditional water planning approaches, but this approach is facing increasing opposition: water technology alone is not sufficient to address water sustainability and there is a need for sustainable technologies to be adapted to specific socio-economic context. In the same time new methods are being developed to strategically assist meeting the demand of growing population in the Mediterranean, based more on water use efficiency, participative approach and good governance, including the construction of large-scale water transfer and supply infrastructures.

The last 10 years the research agenda was gradually shifting to explore efficient ways of water saving (particularly in agriculture), implementing options for managing demand and reallocate water among users. However, new approaches will also likely fail if they are not supported by real participatory approach, communication among interested stakeholders, water players and citizens, institutional strengthening, relevant education, common knowledge, mutual awareness of interested parties.

The literature is rich with regard to small- to medium scale technological trials / projects (end-user scale) and assessment of water management options. However the most recent literature and field experience revealed the need for more integrated and common efforts focusing on the following elements: -) establishment and application of water management policies coherent with the emerging need of ensuring sustainable development and adaptation to changes; -) developing coherent national-regional policies including sustainable strategies for water resources management and water ethics; -) improving the efficiency and capacity of public administration at the local and central level; -) appraising water actions from the point of view of culture, economics, environment (including health); -) overseeing the promotion and enforcement of national legislation and guidelines for best practices; -) setting new and more coherent water pricing and water governance; -) creating a common knowledgebase to settle water conflicts; -) developing policies and strategies to manage impact and to adapt to cultural, political, climate and financial changes.

The literature lacks an adequate overview of water management experiences throughout the Mediterranean, particularly those with potential for replication, as well as a tentative assessment / modelling of results which could be achieved by comparing, integrating and up-scaling local experiences, accounting also the active public participation and community involvement. Significant challenges still remain in the areas of technological, managerial and policy innovation and adaptation, human resources development, gender roles in water management (particularly in rural areas), sharing common knowledge, gathering a new frame and consensus on the use of sustainability indicators (economic, social, environmental, institutional). Constraints to the uptake of effective research / project results are of two kinds: -) local level projects are scattered and fragmented, often different standards are used and results are difficult to be compared and integrated; -) water management practices are not standardized across the different Southern Mediterranean countries, as they vary from country to country and from basin to basin; -) the legislative and institutional system does not support the implementation of innovative research results or approaches.

The European Commission as well as other donors (ex.: EU Member States) extensively funded collaborative research and support actions along the past 10 years on water management issues and there is a significant number of technical and socio-economic data and information on water resources in the Mediterranean. Relevant Euro-Mediterranean regional S&T dialogue on water was carried out in several EU funded actions (ex.: WASAMED, MELIA). Dialogue and research produced results and guidelines, mainly shared within the agora of researchers, but it still needs proper national and trans-national dissemination and share with decision makers, users and society.

3) Definition of the main elements for a medium to long term agenda of Euro-Mediterranean Cooperation in Research and Innovation.

Specific objectives in relation to topics

Water scarcity and management under climate change

- Developing approaches to risk assessment, impact evaluation and adaptation, providing options for wide-range problems
- Adaptation policies development to drive adaptation actions.
- Strengthening the climate change knowledge base
- Engage stakeholders by developing suitable methodologies for assessment of impacts, vulnerabilities and planning as a pre-requisites for cost-effective water management adaptation
- Increase societal awareness and capacity building to support the implementation of adaptation measures to address a particular water risk under climate change.
- Developing sustainable innovative technologies and concepts in water saving, water use efficiency, water productivity, use of non-conventional waters, water harvesting and conservation as options to mitigate risk and impact by climate change.
- Water management under long-term drought conditions: early warning, prevention and preparedness.
- Management of extreme flood events: early warning, prevention and preparedness/contingency plans.
- Developing robust and flexible water data base systems with efficient monitoring systems at the regional level for climate projections

Ensuring sustainable access to limited water resources

- Optimal allocation of scarce water resources, both between and across different users
- Institutional strengthening and participatory water management
- Improving water sanitation to reduce water related diseases
- Water pricing, cost recovery mechanisms and efficient water charge policies
- Basin-wide cooperation between riparian states

Water use in agriculture: interlinks between lands and water use – cultural heritage and behaviour

- Ecosystem based management of agricultural waters
- Improving participatory approach in agricultural water management
- Enhancing innovation and sustainable use of agricultural water management through an appropriate inclusion of cultural heritage (ex.: sustainable re-use of “foggara” for irrigation).
- Management of agricultural waters under scarcity conditions: sustainable land-use changes, alternative agricultural practices, water use efficiency and system performance, water productivity (water-plant-soil), use of unconventional waters (including wastewater reuse and related nutrients valorisation)
- Technologies in water saving, water use efficiency, water productivity, use of non-conventional waters (including gray waters and treated wastewater reuse and related health issues), water harvesting and conservation, distribution system.

Main intervention strategy

- Competitive research to enhance innovation in relevant water sectors (water use efficiency-productivity, system performance, non-conventional water, water risks, access to water)
- Regional approach to water management, including build of knowledge share and efficient transfer of mechanism for the use of research results at regional level, common monitoring/observatory mechanisms, technology share, water strategies/policies alignment.
- Capacity building including a wide array of actions such as organizational reforms, institutional strengthening, science-policy interfacing, training and networking, participative approach implementation. Capacity building has to be rationalized to reach researchers as well as public, private, NGOs and water users.
- Strengthening national water governance to enhance innovation in the management of limited water resources.
- Research at both small scale community/catchment and water basin level (including transnational basins).
- Integrating research in local and regional clusters of relevant actors, stakeholders and final users. The participation of stakeholders in all aspects of water management is crucial to the successful uptake of research results and implementation of water policies.
- Create operational synergies with political and multi-stakeholder processes on water in the region, like the Mediterranean Component of the EU Water Initiative, assisting to reach out to policy makers, a range of regional and national players as well as other related initiatives, processes and programmes that provide support to policy making.
- Research development for water multi-uses towards zero water discharge
- Linking Southern Mediterranean Countries' water strategy with the EU Water Framework Directive to improve quality of mutual EU-MPC cooperation and competitiveness in the water sector.
- Research should also be on applied socio-economics aimed at assessing how to induce technological, managerial and organizational-social changes.
- Water cultural heritage as a basis for innovation and adaptation to water risks.
- Fostering regional networking as an effective way of enhancing synergies and allow concentration of efforts, know-how exchange, co-ownership and dialogue.
- Fostering high quality but diversified partnership to promote (i) interface interaction between specialties and sectors leading to new approaches, tools and innovation; (ii) the integrated and sustainability aspects; (ii) collaboration between experienced and new teams for coaching and capacity building in cooperation.

Specific actions and instruments

- Special pre-competitive research efforts to develop technology that can be used for a wide range of costs, management systems, scales and technological advances in the region.
- Pilot demonstrations and real case studies to substantiate pre-competitive research in the water sector in the region, with particular regard to develop income generating water saving and multi-use solutions and alternative at user level.
- Developing tools enabling replication and the scale up (regionalization) of successful pilot / demonstration actions

- Linking research, technology enterprising and water users to enhance competitive research in water use efficiency, drought and flood management, non-conventional water use, water conservation, mitigation of salt intrusion in coastal groundwater and impact of desalination brine discharges to coastal environments.
- Increasing the sustainability of water technology and their adaptation to different socio-economic contexts and treated water uses
- Activities in support of institutional strengthening and participatory water management.
- Supporting the creation of cooperation and financial partnerships among researchers, SMEs, investors, institutions active on water saving, water use efficiency, drought and flood management, unconventional water use.
- Strengthening trilateral financial synergies / co-funding (EU-MS-MPCs) in identified challenges.
- More research cooperation based on equal participation / co-ownership of EU and MPC researchers. In particular, a permanent ERANET type of action, based on variable geometry, could be established to ensure continuity of actions and commitments by MPC, MS and EU to achieve common water challenges.
- Facilitate the engagement of Mediterranean Partner Countries in the EU Water Technology Platform (ex: Water Supply and sanitation Technology Platform).

4) Conclusions

The Water Panel of the Euro-Mediterranean Conference on Research and Innovation of 2-3 April 2012, concluded that the following important issues are to be focused:

- Developing capacities in risk assessment, planning and adaptation through adequate good governance, stakeholders / societal engagement”
- Good governance to ensure equity in water allocation , sustainable water management and institutional reinforcement.
- Holistic but competitive research and innovation in water quantity management and use efficiency, and management of non conventional waters.

In addition, the panel concluded that the following main challenges need to be addressed:

- Ensuring water management for all ecosystem functions and food security. Political willingness is needed to ensure a multi-sector and multi-scale approach.
- Strengthening societal and water users empowerment, improving dialogue as well as mutual trust among institutions, researchers and society.
- Building a regional co-ownership on water resources management, from challenges identification to financial and implementation synergies

Moreover the following priorities have been identified:

- Adopting the Mediterranean Water Strategy and Action Plan which will provide the financial and instrument framework for the future.
- Partnerships to create conditions for competitive research in water use efficiency, use of non-conventional waters, risk management.
- Regional joint funding for trans-basin cooperation and regional water innovation programme.

Parallel session 2: Renewable energy and efficiency

Author: Costas N. Papanicolas, President, The Cyprus Institute, Cyprus
Claude Ayache, former Director of European Affairs, CEA, France

1) Proposed topics to be covered:

- 1. Integration of renewables and grid developments – technology challenges*
- 2. A vision for a common Mediterranean R&I strategy for renewable energy*
- 3. Energy innovation to supply domestic market and for export*

Integration of renewables and grid developments – technology challenges

Diego Martínez, CIEMAT, EERA Solar Joint Programme Coordinator, Spain

This presentation should focus on the technological challenges for the Mediterranean region, mainly on wind and solar energy, integration to grids and the need for grid development.

A vision for a common Mediterranean R&I strategy for renewable energy

Houda Allal, Director of Renewable Energy and Sustainable Development, Observatoire Méditerranéen de l'Energie

This presentation should focus on strategies for low-carbon energy technology development and policies around the Mediterranean Sea, tackling possible synergies and the potential for cooperation towards a common innovation space.

Energy innovation to supply domestic market and for export

Juan Alario, Associate Director, Head of Division, Energy Efficiency and Renewables Energy Department, EIB

This presentation should focus on the drivers and existing tools for energy technology development: domestic energy programmes, foreign investment, existing funding schemes and end markets.

2) State of play

This section will address above mentioned topics and try and focus on the following specific issues:

- Gaps still to be addressed and problems to be solved;
- Scientific-technology advances in last 10 years;
- Overview of relevant programmes/projects/actions.

Introduction

Energy, in all its aspects, has become an issue of the utmost importance globally. Security of supply, economic and environmental impacts of energy production and consumption, are pertinent to all regions of the world. With the undisputed impact of fossil fuel usage to the environment and its relation to climate change [1], a transition toward a low-carbon sustainable economy is imperative in the next few decades. In the required radical reconfiguration of energy production, transportation and usage, renewable energy sources are called to play a central role, and in conjunction with grid technology advances and improved energy efficiency ensure a more efficient and sustainable development.

This transition needs to be made in a comprehensive manner, taking into account specific conditions and factors for each region and addressing potential negative impacts as well as opportunities on industrial competitiveness and on society. Research, innovation and careful deployment of new technologies could not only alleviate risks on reduced competitiveness and growth, they could lead to the development of new sectors of the economy, the so called “green economy”.

The Mediterranean area is singularly important and unique in the challenge it faces and the opportunity it offers. Climate change models robustly predict that it will be affected in particularly adversely terms: temperatures will rise, rainfall will be drastically reduced and as a result energy demand will rise. This climate –energy –water nexus will be a principal driver in the socioeconomic development of its people.

The Mediterranean Area

Despite its global nature, the sustainable energy challenge varies in different geographical areas. The Mediterranean basin is suited to particular renewable energy resources, and faces specific and diverse environmental challenges, and economical and societal needs. It enjoys an excellent solar potential with small cloud coverage and the high irradiation factor throughout the year. For this reason solar technologies are the distinct favourite, although penetration has been minimal thus far [5]. Wind power and Mediterranean-specific biomass also constitute a potential to be developed further. Currently Mediterranean countries are predominately depending on fossil fuel for electricity production, an inexpensive choice compared with renewables, which can only develop through support mechanisms such as feed-in tariffs. At the same time the Mediterranean region is expected to face the harsh economic and environmental consequences of climate change, such as freshwater shortages and diminishing agricultural production [6]. With such environmental changes, it is expected that in addition to the increasing electricity demand due to population and economic growth, further electricity requirements are expected for desalination and air conditioning exacerbated by the tourist influx during summer months and the lack of proper energy conservation and build environment methods (such as building insulation).

The Mediterranean rim is also characterised by strong economic and technological divergence amongst countries of the region, and with central and north EU countries. Many countries have strong needs in the economic, social and innovative development while a few are highly developed and technologically advanced. Energy-related infrastructures such as the electrical grid are generally not adequately developed and require significant investments for an upgrade capable of sustaining future needs. Energy conservation and advanced built environment methods to increase energy and electrical use efficiency are tremendously underdeveloped. The potential of significant gains in this area is substantial even with modest investments.

Yet another special consideration concerns islands and island countries, a typical encounter in the Mediterranean region which have to employ secure and sustainable energy systems in an autonomous (or close to autonomous) way. Islands require not only a different approach in energy systems deployment but also more robust technologies in renewable technologies suitable for such environments such as hilly terrain, corrosive coastal conditions, etc. Autonomous energy production and systems meet also inland needs when interconnecting infrastructures are not developed enough.

Technological Challenges

Renewable technologies have not yet evolved to the level required to take upon a significant portion in electricity production. While significant technological developments during the last ten years have brought them to the level where it is universally accepted that wind and in particular solar have a unique potential for the electricity production balance globally and particularly in the Mediterranean rim countries, how rapidly this can be achieved is still a matter of debate. Superb examples are the wind power, now technologically mature and even financially competitive or the fast evolution PV technologies which are rapidly becoming more efficient and less expensive and thus more competitive but still require subsidies to be economically viable investments [2]. Similarly solar thermal technologies have also progressed with a number of demonstration plants constructed and operated with significant daily thermal storage.

A significant limitation, which renders solar and wind not ready for large scale deployment is their intermittent nature. Although storage technologies exist which could compensate for this shortcoming, continuous, financially competitive and stable dispatchability has yet to be demonstrated. The lack of an inexpensive and efficient way for storing energy has become one of the greatest challenges of this century and is easily identified as a field where extensive R&I is needed. Currently energy storage is a prime field of research around the world. The field is largely unexplored as signified by the diversity of explored solutions (e.g. electrochemical, electrical, thermal and mechanical). Energy storage will also provide a solution to another significant problem which is the connection of renewables to the power grid, a process which is complicated and compromises its stability. [3]

Grid stability through new grid technologies is also identified as a new field, which demands further research. Smart power grids also need to be developed to accommodate the expected diversity in energy input but also to react to variable consumer demand in a more efficient and economical way. Innovative ways of power distribution and transportation are also included in this research effort, which is highly supported and encouraged by the European Commission [4].

Specific Energy systems should be worth to be conceived and developed both physically and operationally to help address specific needs in isolated zones.

As highlighted above, another area which is lacking in research and development is energy conservation and built environment. A more efficient and sustainable energy usage dictates significant changes in the design and construction of buildings, the choice of materials and the employment of technology for controlling the human environment. Specific solutions suitable for the Mediterranean climate need to be developed.

R&I in the Mediterranean

The above considerations should be taken into account for maximizing the impact of Research and Innovation efforts of the different stakeholders and their collaboration. Such efforts will not only address specific problems encountered in current renewable-related technologies, but will have tremendous impact on the economic development of the Mediterranean region. R&I efforts in the fields of renewable energy and smart grids and energy efficiency in the built environment sector present opportunities to develop new enterprises, create new jobs and contribute to the economic growth of the region (see for instance [7]). Besides the support of R&I to specific local and regional needs, it should also allow Mediterranean rid to become the locus of intense low-carbon energy production and exchanges. Initiatives such as DESERTEC emphasise the potential that electricity production through renewables holds for the Mediterranean region as a cheap and abundant export product to the central and north European countries [8] but also highlight the need for developing the necessary infrastructure such as an interconnected super-grid between the Mediterranean region and Europe, with the employment of innovative technologies such as HVDC lines [9]. It also highlights the issue of political and social stability along with the risks of energy security.

Financial support

To achieve the climate and energy objectives of the EU and Mediterranean area, it is key to invest and accelerate technological progress of low carbon technologies (mainly RE&EE), including non-technological innovations (new practices, in particular for EE).

Access to risk capital and financing plays a critical role, notably to develop innovative enterprises, demonstration or pilot plans and support the early market penetration phase of emerging technologies. In the case of renewables (RE) & Energy Efficiency (EE), support of early market penetration phase is fundamental to achieve economies of scale and promote innovation, mainly through learning-by-doing. The EIB has a battery of instruments to support these activities in the south of MED countries, going from senior loans to risk capital, including the possibility of using the Risk Sharing Finance Facility of the Commission/EIB in some countries. There are also Technical Assistance (TA) facilities available to support EE&RE projects or initiatives (FEMIP TA facilities to support project preparation and implementation, and the FEMIP trust fund to promote new initiatives, such as policy, regulatory or institutional reform).

The Mediterranean Solar Plan (MSP) aims at developing the large EE&RE potential of the MED region and thus indirectly to promote innovation in these areas. The EIB plays a coordinator role of the financial aspects of the MSP within the UfM. The EIB cooperates with the EU Commission, UfM and other IFIs to achieve the objectives of the plan. Some key obstacles to implement the MSP are related to the lack of adequate policy and regulations to support RE&EE in many MED countries, difficult access to financing (it has worsened since the economic crisis) and the existence of a financial gap for some RE, notably solar technologies. The EIB support developments in these three areas, often in cooperation with the UfM. We participate in several working groups (regulation, financing, Article 9 of the RE directive, etc.). Concerning TA, two new EIB/Commission initiatives should be mentioned: the MSP-Project Preparation Investment facility and the study to extend ELENA facility to MED in order to support the development of EE&RE in cities.

Recommendations

It is imperative that a coordinated policy of research infrastructures and demonstrator projects should be established for the Mediterranean area in order to adapt general approaches (SET Plan EIIs, ESFRI Energy Roadmap) to its peculiarities and to optimise the corresponding investments to be realised in the area.

Coordinated R&I programs should be specifically opened to the Mediterranean area, especially using the Joint programs of the European Energy Research Alliance (EERA) and the innovation incentives provided by the EIT KIC for sustainable energy (InnoEnergy).

Co-development policy should also be further coordinated and include capacity building in the domain of R&I to conduct world-class research as well as in the support to deployment and maintenance of new energy technologies.

Special care must be given to the education and training of the human capital necessary to address the research and innovation as well as the industrial needs. This also means developing the human capacities needed to accompany the transition in its different stages while taking advantage of opportunities for activity creation. Dispositions to prevent brain drain must be taken.

3) Definition of the main elements for a medium to long term agenda of Euro-Mediterranean Cooperation in Research and Innovation:

This section will address:

- Specific objectives in relation to the topics;
- Main intervention strategy: including national, regional perspectives and the role of international cooperation activities;
- Specific actions and instruments: including range of actions and instruments necessary to achieve the objectives e.g. training, technology transfer, capacity building, support to reforms, investment opportunities for business, etc.

A regional approach is the preferred option for cooperation with Mediterranean Partner Countries, as this approach could bring a strategic added value to bilateral cooperation. Due to the gap in research capacities and between state-of-the-art technology on both sides of the Mediterranean, Euro-Mediterranean cooperation on energy technologies has only partially been in the scope of energy R&I cooperation in FP7. Indeed, international cooperation is only promoted where it serves the priorities the Strategic Technology Plan (SET Plan). Accordingly, linking energy R&I cooperation with development policy in the field of energy and with the Neighbourhood policy could provide an optimal approach to energy issues in Mediterranean countries.

The Mediterranean Innovation and Research Coordination Action (MIRA) Thematic Workshop on Energy Research in Cairo in March 2009 was instrumental in identifying priority topics for the region for inclusion in future FP Work Programmes. In the same spirit, the redefinition of the great lines of Euro-Mediterranean cooperation at the Euro-Mediterranean Conference on Research and Innovation in April 2012 will provide an important and timely input to the redefinition of the international cooperation on energy research and innovation for Horizon 2020 and to the development of international cooperation in the SET Plan.

Objectives

a. Increase R&I in the Mediterranean countries on low-carbon energy technologies in particular solar and wind power.

As many Mediterranean countries have realised, the challenge of switching to cleaner, more sustainable and more efficient energy is a global one and the European experience and technology can contribute to the development of Mediterranean energy systems able to use their own local resources to support sustainable development on all side of the Mediterranean.

b. Adopt and develop new methods of energy conservation and built environment strategies and strategies for management of energy resources.

c. Develop and upgrade energy infrastructures and particular the power grid throughout the region.

Grid adaptation is necessary to the inclusion of new and renewable energy to grids and the development of grids will be needed to ensure access to energy is all parts of the Mediterranean region, taking into account local factors such as climate, adaptation to existing infrastructure and access to energy in isolated areas. Domestic applications and integration to industrial processes should also be sought, e.g. solar energy for access to water.

d. Develop and modernize energy research capacities in the Mediterranean

The gap between the EU and Mediterranean countries is wide on low carbon energy technologies, restricting possible cooperation and contributing to brain drain. Increasing R&I in the Mediterranean implies linking capacities to innovative applications and public policies favourable to introducing low carbon energy technologies, coordinating with EU infrastructure network in the

field of energy as well as staffing research centers and innovative companies with well-trained professionals.

e. Further strengthen bi-regional energy R&I cooperation

In the spirit of bi-regional cooperation, collaboration and better coordination amongst Mediterranean countries should be supported as well as between EU external policies and between EU and the Member States. Energy R&I cooperation needs to take place in a broader Euro-Mediterranean partnership providing a stable framework.

Integrating the Mediterranean component into the EU Energy Research and Innovation system

Possible options to follow-up to the Euro-Mediterranean Conference on Research and Innovation 2012 include:

- Public events and international cooperation activities of the SET Plan EIIs and EERA JPs in the areas relevant to the Mediterranean, e.g. the EII Solar Europe of the EERA JP on CSP, including on education and training
- General opening of the EU framework programmes for energy R&I, i.e. FP7 Energy and the societal challenge "Clean, Secure and Efficient Energy" under Horizon 2020
- Regional and INTERREG policies
- EIT KICs (Knowledge and Innovation Communities)
 - InnoEnergy SE : sustainable energy
 - Climate KIC : adaptation and mitigation to the climate change
- The ESFRI 2010 energy roadmap
- EIB and RSFF
- Connection with the Union for the Mediterranean Senior Officials Meetings and Mediterranean Solar Plan
- Euro-Med MoCo 5-6 June 2012, Brussels
- Competitiveness Council, end July, Brussels (date tbc)
- Other initiatives?

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Parallel session 3: Fighting diseases and improving well-being

Main author: Domenica Taruscio, with the input from all the Colleagues of the panel

1) Proposed topics to be covered:

1. *Rare diseases*
2. *Non Communicable diseases, Diabetes, Obesity*
3. *Health in a changing environment*

2) State of play

Rare diseases

Rare diseases (RD) are a serious public health problem and represent unique challenges in many Countries. RD are characterized by a low prevalence (in EU < 5:10000), are numerous (> 6-7.000), including many congenital anomalies, most of them are life-threatening or chronically debilitating. About 80% of RD has genetic origin, whereas most of the remaining are multifactorial: in a few cases approaches to primary prevention exist. Overall a considerable number of citizens can be affected (e.g. in Europe more than 30 million of citizens). Targeted integrated efforts (prevention, early and appropriate diagnosis, access to available treatments, including rehabilitation) are needed to reduce the global population effects of RD, such as early mortality and disability as well to improve the quality of life of affected persons. RD are not limited by geographical boundaries and global partnerships are rapidly expanding across the community of RDs.

Non Communicable diseases, Diabetes, Obesity

The global burden of non-communicable diseases (NCD) such as heart disease and stroke, cancer, diabetes, and chronic lung disease continues to grow; these diseases are the leading causes of death globally and addressing them constitutes one of the major challenges for development in the twenty-first century. NCDs are paradigm for multifactorial diseases: prevention and treatment must cope with a number of factors ranging from genetic predisposition, through to diet and nutrition, living environment, lifestyle (individual) and social (community) factors. Also, refinements on pathogenesis and diagnosis lead to the identification of many subtypes within highly prevalent NCDs. Any science-based public health action should avoid both to stick to established knowledge only as well as to “drown into complexity”.

Health in a changing environment

Emerging infectious diseases (EID) are taken as a representative example and model of health issues in a changing environment. Scientific evidence support that EID are linked to modification trends related to climate, pest and wildlife ecology, animal husbandry, social structure as well as travelling of people, foods and livestock. Changes in infectious diseases, including zoonoses, vector-borne, and food-borne outbreaks and antibiotic-resistance are currently scrutinized and assessed by EU bodies such as the EU CDC and the EFSA. EID definitely call for the “one health” paradigm, integrating an expertise network from ecology, biology, agriculture, veterinary medicine and human medicine.

Overall, to translate research into primary and secondary prevention and treatment is, indeed, a major challenge shared by all three areas.

2.1. Gaps still to be addressed and problems to be solved

2.1.1. Rare diseases

The adoption of the Commission Communication (2008), and of the Council Recommendation (2009), and the adoption of the Directive on Cross-border healthcare have created an operational framework to act in the field of rare disease with European coordination in several areas (national plans or strategies, classification and codification, European Reference Networks, orphan drugs, European Committee of Experts, etc.).

Many Countries, including Mediterranean EU Countries (e.g. France, Italy, Spain, Greece) adopted actions to tackle rare diseases in order to improve prevention, early diagnosis and appropriate treatments. Prevention and management of rare diseases in Europe is relatively well structured but rare diseases are still neglected in South Mediterranean Countries. Although several programmes on rare diseases have been funded in the different framework programs, contribution of South Mediterranean Countries in these projects is still modest. Among the 7000 rare diseases, the aetiology is still unknown for more than 2000 disorders; about 30% of rare disease patients are without diagnosis. The majority are without a specific treatment, only symptomatic therapies being available. Centres of expertise for diagnosis and treatment of rare disease patients are available in some countries, whereas in the majority are lacking. European reference networks for rare diseases are very few; they which should serve as research and knowledge centres, updating and contributing to the latest scientific findings, treating patients from other Member States and ensuring the availability of subsequent treatment facilities where necessary. Developing consensus criteria and systems for rare disease surveillance will be crucial to assess health needs and costs as well as to plan and evaluate health programs.

Moreover, investigation of rare diseases may also have a direct or indirect impact on common disorders.

Rare diseases is an area with enormous and practical potentialities for Euro-Med cooperation

2.1.2. Non Communicable diseases, Diabetes, Obesity

Prevention of NCDs recognize a series of gaps, such as a) strategies to effectively communicate to people so to empower the reduction of established risk factors (tobacco smoke, lack of physical activity, etc.); b) action at community level to enable the reduction of established risk factors, with a special attention to younger generations (e.g., guaranteeing schoolchildren healthy food catering and opportunities for physical training); c) characterizing the role of new protective factors and risk factors identified by recent research, taking into account age- and gender-related differences (supply of trace nutrients, antioxidants, exposure to contaminants, etc.). Good surveillance systems for non-communicable diseases and their risk factors are crucial for measuring the magnitude of the problem and its associated costs, identifying vulnerable subgroups, and evaluating the effects of policy and practice interventions, especially in low- and middle-income countries where such data are lacking. Equity issues can show-off if public health actions overlook some less favoured population subgroups (e.g., immigrant groups). A main challenge would be to place and support public health actions towards NCDs in the scenarios of lower-income Mediterranean Countries.

2.1.3. Health in a changing environment

In the field of EID, the main challenge is the development of the “One Health” approach: this requires the characterization of the strong connexions between wildlife, domestic-animal, and human diseases, together with their dependence on environmental and economic drivers. In the specific field of EID it is critical to integrate the veterinary and the human epidemiological surveillance. The Mediterranean area is key to develop the “one health” paradigm. The Mediterranean region concentrates key factors influencing the emergence of EID: disruption of terrestrial and aquatic biodiversity, sensitivity to climate change, increased livestock production, proximity of human and animal habitats, uncontrolled urbanization resulting in

unhealthy human habitat, increasing the risk of food-, water-, and vector-borne infections. Changes in the distribution and abundance of vectors also contribute to the emergence of pathogens. Thus, an increased knowledge on the multi-faceted ecological and social system of the Mediterranean region would be crucial to understand health issues in a changing environment.

2.2. Scientific-technology advances in last 10 years

2.2.1. Rare diseases

Since the end of the Human Genome Project (HGP) in 2003 and the publication of a reference human genome sequence, genomics and at a larger extent “omics” has become a mainstay of biomedical research. During the last years, a wealth of omics related new technologies has been developed. Optimism about the potential contributions of omics for improving human health has been fuelled by new insights about the molecular basis of inherited diseases and the role of structural variation in disease, some of which have already led to new therapies. Other advances have already changed medical practice: for instance, pharmaco-genomic testing is routinely performed before administration of certain medications. Together, these achievements show that genomics is contributing to a better understanding of human biology and to improving human health. Benefits from genomic research have been observed in MPC countries for the diagnosis and prevention of genetic diseases, nevertheless, these countries are experiencing “omics divide” and a strong effort still needs to be achieved in order to introduce health research into the omics era.

2.2.2. Non Communicable diseases, Diabetes, Obesity

During the last ten years achievements did concern the areas of system biology, biomedical imaging, pharmacology and pharmacogenomics, stem cell and organ therapy.

Advances in diverse clinically applicable technologies, e.g. whole genome investigations and functional imaging, may provide opportunities to interfere with the pathways from the genes through the phenotypes: this has opened up for new ways of understanding NCDS, in particular obesity and its related health problems; however, in spite of huge investments, a comprehensive picture (“from gene to community”) is not available yet.

2.2.3. Health in a changing environment

Till now, besides the “one health paradigm” achievements in EID field included diagnostic methods targeting known pathogens and vaccines against zoonoses like Rift Valley fever. Indeed, the rapid identification of EID is crucial in a context of trade and travel intensification. However, such achievements are still insufficient. Meta-genomic techniques, such as microarrays and high-throughput sequencing, are ideal for the systematic detection and identification of known and novel pathogens. In the field of vaccines, effective and safety of new-generation vaccines must be assessed together with diagnostic tests differentiating infected from vaccinated subjects, especially in areas close to reach disease eradication or where virus circulation is very low.

To achieve an efficient control of trans-boundary emerging diseases, regional strategies must be implemented. A science-based design of such strategies necessitates the availability of quantitative and predictive epidemiological models as a building block for economic models for *ex ante* assessment of these strategies. Moreover, risk-perception studies are needed to assess how disease surveillance and control stakeholders, including citizens, may react to prevention programs, and thus improve the efficiency of these programs. The implication of social sciences is essential for the success of prevention plans in different agricultural and social scenarios.

- **Overview of relevant programmes/projects/actions.**

Rare diseases

Over the last two decades, collaborative and coordinated research projects supported by successive European Community Framework Programmes for Research and Technological Development have made a substantial contribution to advancing knowledge on rare diseases. Research on Rare Diseases has offered us a much better understanding of the mechanism of common conditions, as they represent a model of dysfunction of a biological pathway. The FP5, FP6 and FP7 programmes supported several research projects on rare diseases.

DG SANCO /EAHC has funded many projects on rare diseases which can be visited on the EU portal http://ec.europa.eu/health/rare_diseases/projects/index_en.htm

Orphanet web portal (www.orpha.net)

EUROPLAN (2008-2011 and 2012-2015) project founded by DG-SANCO/EAHC (<http://www.europlanproject.eu>). EUROPLAN 1 established a network among countries of EU MS and South-East Europe to elaborate recommendations for developing national plans or strategies on rare diseases and indicators to monitor the plans. EUROPLAN 2 aims at promoting an international network for capacity building for the development of national plans/strategies on rare diseases (sharing tools, experiences and knowledge).

EPIRARE (2010-2013) project founded by DG-SANCO/EAHC (<http://www.epirare.eu>) involves 16 countries in 3 continents, including several Mediterranean countries (France, Italy, Spain, Greece). The project is dedicated to prepare a European platform for the registration of rare diseases registries.

BURQOL-RD (Social Economic Burden and Health-Related Quality Of Life in Patients with Rare Diseases in Europe) project founded by DG-SANCO/EAHC www.burqol-rd.com. The main aim of this project is to develop a disease based model capable of quantifying the socio-economic burden and Health-Related Quality of Life (HRQOL) for patients in Europe with rare diseases and their caregivers. It involves several countries including the following Mediterranean countries (Spain, France, Italy).

Collaborative projects including partners from MPC:

No specific program (i.e. SICA) for rare diseases, rare disease consortia limited to EU MS countries. Researchers from ICPC considered as “biological material providers”.

Some exceptions do exist e.g.: DEEP: Deferiprone evaluation in paediatrics. <http://www.deep.cvbf.net/home/Default1.aspx?C=1>

For non-communicable diseases SICA for diabetes, obesity in migrant populations, programs starting this year, impact to be evaluated in the next few years.

The **Episouth / Episouth-Plus** (2006-2010 and 2010-2013) networks are founded by DG-SANCO/EAHC and EuropeAid, together with the participating national partner Institutions with the financial support of the Italian Ministry of Health and ECDC (<http://www.episouthnetwork.org>). The network is established among countries of South-East Europe, North Africa and Middle-East to create a framework of collaboration on epidemiological issues for enhancing communicable diseases surveillance and control of public health risks through communication, training, information exchange and technical support to countries in the Mediterranean region.

For vector-borne infections, several FP7 projects involve Mediterranean countries:

EDENext (<http://www.edenext.eu>) “Biology and control of vector-borne infections” is a large collaborative project (2011-2014), gathering 22 countries and 46 partners including Portugal, Spain, France, Italy, Albany, Greece, Turkey, and Senegal. It builds on the FP6 EDEN project (Emerging diseases in a changing European Environment: 2004-2010).

ArboZooNet (<http://www.arbo-zoo.net>) “International network for capacity building for the control of emerging viral vector-borne zoonotic diseases” is a coordination action (2008-2012). The project aims at promoting an international network for capacity building for the control of these diseases, in particular West Nile, RVF and CCHF.

CCH Fever (<http://www.cch-fever.eu>) is a collaborative project for modern approaches to diagnostics, epidemiology, prevention, therapy and preparedness against CCHF (start in 2010). The consortium brings together 14 partners from 10 member states and associated EU countries, as well as USA and South-Africa. Mediterranean countries are France, Albania, Turkey, and Israel.

EuroWestNile (www.eurowestnile.org) is a collaborative research project dedicated to improving the knowledge of the biology, ecology and epidemiology of the West Nile virus in Europe, and to provide innovative tools for its prevention and control. It started in 2011 and involved several Mediterranean countries: Spain, France, Italy, and Israel. Senegal is also involved.

VECTORIE (<http://www.vectorie.eu>) is a collaborative project devoted to risk assessment and control of West Nile and chikungunya viruses. The goals are to enhance Europe’s preparedness for vector-borne emerging diseases through: (i) the creation of an integrated research capacity on vector-borne emerging diseases in Europe, uniting researchers from different fields, (ii) the contribution towards improved ways to monitor spread, diagnose, prevent, control and treat vector-borne diseases in Europe. Mediterranean partners include France and Turkey.

VBORNET (<http://www.vbornet.eu>) is a network of medical entomologists and public-health specialists of vector-borne infections, supported by ECDC. It does not cover North Africa and the Middle East, at the exception of Turkey.

The Mediterranean Animal Health Network (**REMESA**) aims at improving the prevention and control against the major trans-boundary animal diseases and zoonoses through the strengthening of the national and regional resources and capacities, the harmonization and coordination of surveillance and control activities: see <http://www.remesanetwork.org>. Ten Western Mediterranean countries are involved: Algeria, Egypt, France, Italy, Libya, Morocco, Mauritania, Portugal, Spain and Tunisia. Four thematic sub-networks have been set up: laboratories, epidemiology, communication, and socioeconomics.

3) Definition of the main elements for a medium to long term agenda of Euro-Mediterranean Cooperation in Research and Innovation:

3.1. Specific objectives in relation to the topics

All the topics proposed for this session and covered in the previous section are examples of health problems and therefore health research fields prioritized in countries of the Euro-Mediterranean geographic region. Thus, they can be taken as fields where Euro-Med cooperation in Research and Innovation can be initiated, and if successful, validated for posterior extension to other fields or problems.

At a time when some Mediterranean countries are building new social and political environments two types of overarching objectives should be proposed for Euro-Med cooperation:

- To interpret health as a right, meaning that even if this right is not achieved immediately, at least it should not be put into question as an objective.
- To define the role of research in the field of health to achieve the first objective through innovation in the provision of equipment, technologies, procedures and policies.

It is now a time of changes in the Euro-Mediterranean region. Aiming at being an open region, Europe faces not only health problems shared with other regions, but also wants to build its potential by collaborating with them, and at the same time its institutions are learning to collaborate with each other within Europe. In the other side, there is a strong interest of non-European countries from the region on collaborating with Europe. Moreover, the variety of genetic, environmental, social, lifestyle and healthcare determinants of health across the Euro-Med region offers a unique opportunity for research to identify origins of diseases and new ways of fighting them. Therefore a third objective should be mentioned:

- To foster Euro-Med collaboration in health research in fields where this collaboration is important to address the scientific challenges, or where joining efforts provides the needed resources.

3.2. Main intervention strategy: including national, regional perspectives and the role of international cooperation activities

A mid to long-term Euro-Mediterranean collaboration needs work at essentially three decision-making levels. First, it requires a clear political decision, which must be followed by funding commitments and mechanisms. Second, some kind of scientific governance has to be organized and maintained. Third, the involvement of potential beneficiaries or stakeholders has to be present. At the same time, it happens that these decisions depend mainly on national structures, except for decisions of transnational governing bodies such as the European Commission. International cooperation activities or transnational structures may trigger and frequently take the lead of strategies that involve national bodies.

The main intervention strategy will require the creation of three governing structures which could be roughly defined as:

- A *policy governance structure*, with the mandate to take overall decision power of the collaborating strategy, including funding.
- A *scientific governance structure*, with the mandate to define the scientific agenda, proposing concrete actions and providing scientific overall evaluation of the strategy and of each action.
- A *representation of societal stakeholders* of the results of the research performed under this strategy.

3.3. Specific actions and instruments: including range of actions and instruments necessary to achieve the objectives e.g. training, technology transfer, capacity building, support to reforms, investment opportunities for business, etc.

Health as a right: From the point of view of research, this first objective means making *research that enables advancing in the provision of health care for all*, and making *research on the consequences of any other policy field on health*. For example, the relation between food production and distribution, and chronic diseases. Interestingly, it should include studies on the effects of respecting human rights on health, for instance, respecting women's rights on, maternal health. The same is also clear for some Rare Diseases and was very well discussed for HIV in the past.

Role of research in health: For the second objective, it is interesting to take into account that essential research capacities are at the same time essential public health capacities. Therefore, *capacity building and training* should be prioritized accordingly, so that research policy and health policy are intrinsically associated at least in a core space. From the several actions that can be taken, training and capacity building should perhaps come first, to set a platform of personal and institutional relationships that can in the future open to more diversified collaboration, for instance mutual assistance.

Euro-Med collaboration: Having defined the most important criteria for Euro-Med collaboration in terms of overall objectives and the role of research, a forum should be open to *match demands and supply* from all participating institutions in the region specific for each type of action. For example, for exchange of scientific personnel, or for training activities, or for institutional twinning.

1) Proposed topics to be covered:

1. *Competitive, green ports and hinterland connectivity*
2. *Transport network and logistics networks*
3. *City development and urban mobility*

2) State of play

- Gaps still to be addressed and problems to be solved;
- Scientific-technology advances in last 10 years;
- Overview of relevant programmes/projects/actions.

2.1. Competitive, green ports and hinterland connectivity

Gaps to be addressed and problems to be solved

This topic addresses sustainable development of Mediterranean ports including hinterland connectivity to support the expected increase in exchanges of goods while fulfilling present and under development standards and regulations concerning efficiency, back harbour goods transfer, safety, and green as well as sustainable construction and upgrading.

One of the problems to be solved in view of competitiveness is the relationship between ports and cities (see also topic 3) as underlined by the European Commission⁽¹⁾ “It is therefore important to both the port and to the city to strengthen their association. [...] This can be done at the level of city planning, for example in terms of collective transport offer [...] We must try to reconcile port activity with culture, sea-related tourism and city-development at large. [...] Two specific matters relating to the relationship between ports and cities are especially relevant from a Community perspective: environment and security. In fact, one of the reasons why ports are often criticized by the local community is their impact on congestion and the environment. [...] As for security, protection against terrorism and crime has made port areas much less accessible than a few years ago, so reducing the possibilities for the people to be in close contact with every day’s port business.”

As far as environmental priorities for Ports, the case of Amsterdam⁽²⁾ is applicable worldwide:

- environmental priorities quite radically changed in the last 10 years
- sustainability includes port accessibility improvement and more sustainable good transport (e.g. thanks to modal shift)
- difficulty in cooperating is a significant practical bottleneck.

In this context, example of common challenges to be addressed at Mediterranean level are the fulfilment of:

- a) sulphur ship emissions limitations (MARPOL Annex VI) entering into force in 2010 (see fig. 1) with a maximum 0.5 % sulphur content in the fuel; this is impacting also ports in view of e.g. securing supply of appropriate fuel (including LNG);
- b) NO_x, CO₂ and other emissions international legislations (MARPOL Annex VI) entering into force in the coming years; impact/role of ports is similar to that of SO_x;
- c) “clean water” type of regulations (MARPOL Annex IV and/or Ballast Water Convention); again an important role can be played by green ports e.g. if they provide suitable waste-water reception facilities;

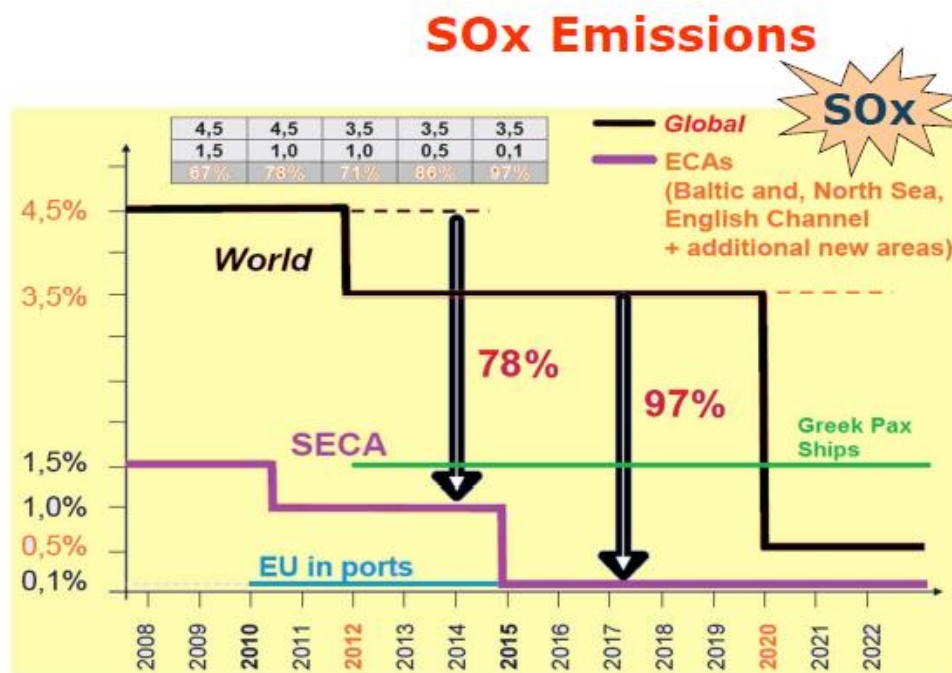


Fig. 1 – SOx emissions regulations

Efficiency of transport is related not only to physical but also to electronic connectivity: this is the reason why, according to the IMO’s FAL Committee⁽³⁾ (worldwide) and to EU Directive 2010/65⁽⁴⁾ (EU Member States), ship departure and arrival formalities shall have to be complied with through ICT interoperable systems. Ports, being the “gate” of waterborne transport, are at the forefront in such developments.

Scientific-technology advances in the last 10 years

Many R&D projects and related initiatives have been launched in the last decade on the above issues. Both green and ICT technologies have been developed to such a stage that they are mature enough for deployment. Without dismissing the need of further industrial research, time is ripe for harvesting R&D results and convert them into pre-deployment projects (see also section 3 of this paper).

Overview of relevant programmes/projects/actions

As far as R&TD is concerned, the most interesting projects have been/are being promoted under DG RTD, Surface Transport programme and/or under EUREKA schemes. Relevant National project exist however they are necessarily more focused on national conditions (e.g. national legislations and/or industrial context) therefore not necessarily appropriate for a Mediterranean (i.e. multi-cultural and multi-national) scenario. It is worth mentioning, for its potential reach, the ENPI MED programme which, however, is still in its infancy.

The OECD "Port-Cities Programme"⁽⁵⁾ is also of relevance: it aims at identifying how ports can be assets for urban development and, among other possible policy measures, it stresses modal shift, green port portfolio analysis, integrated strategy for space and land use and opening the port to the broader public.

When coming to pre-deployment/demonstration projects mention is to be given to TEN-T (Trans European Network – Transport)⁽⁶⁾ type of EU projects which, with their Motorways of the Seas (MoS) part are addressing the implementation of the EU common transport policy through (also) pilot applications.

2.2. Transport network and logistic network

Gaps to be addressed and problems to be solved

North-South transport networks and logistics networks design will be key to the development of safe and clean transfer of goods between the North and the South of the Mediterranean. Issues such as accessibility to peripheral regions and efficient and safe transport corridors covering the whole logistic chain would benefit from common best practices, methodology and modelling.

The Mediterranean area has a large coastal surface and numerous islands and archipelagos requiring maritime transportation for passengers and cargoes. Moreover it is probably the most congested maritime area in the world (some 40% of worldwide waterborne traffic is through the Mediterranean). Consequently, ports are the key nodes and ships the fundamental vehicles for trade, Med Regions among themselves and to their world commercial partners. To properly support these activities, ports and ships must be able to interact efficiently between them as well as with the transport land network. This requires common policies and, even more important, commonly agreed implementation of policies. Within the EU such a “common” approach is granted by the already mentioned TEN-T program⁽⁶⁾ and its “maritime” arm, the MoS priority project. In short, within MoS:

- a) priority EU logistic corridors and an EU “core” port network have been identified, including their maritime legs
- b) a platform is provided for development (through full scale, pilot, demonstration projects) of all the activities required to efficiently reconcile all the key elements involved in maritime transport – ports, ships, human element and organisational systems and procedures; in order to achieve the safe, secure and sustainable maritime operations which are instrumental for European competitiveness

A similar exercise at Mediterranean level, therefore including non EU (but neighboring) Countries is worth being done.

Within the renewed approach to transport cooperation between the EU and its neighbouring regions⁽¹⁰⁾ the Commission recommends to improve and promote infrastructure connections through in particular the definition of networks and prioritization of projects. In the Southern neighbourhood, Euro-Mediterranean transport cooperation has led to the definition of the Trans-Mediterranean Transport Network. In a new response to a changing Neighbourhood⁽¹¹⁾, the Commission proposes a new framework for **transport** co-operation, aiming at closer market integration in the transport sector, notably extending trans-European transport networks (TEN-Ts) to partner countries, addressing administrative bottlenecks with a focus on safety and security issues (including issues such as air and rail traffic management and maritime transport), and enhancing co-operation with various EU transport agencies. The development of an efficient, safe, secure and sustainable multi-modal Trans-Mediterranean Transport Network will also contribute to sustainable and inclusive economic development.

More specifically a Mediterranean-wide approach is lacking on:

- a. efficient connections from and to the core network ports, e.g. efficient multimodal connections to the transport network and matching transshipment performances to other ships and other modes, avoidance of bottlenecks namely through terminal efficiency and infrastructure connections, support the deployment of physical infrastructure to integrate ship and port operations in the transport chain;
- b. clustering of ports leading to an optimised use of common infrastructure and to larger economies of scale and thereby gaining efficiencies and avoiding bottlenecks;
- c. development of geo-strategic ports which will guarantee the security of supply for maritime transport services thus avoiding critical stoppages on the flow of goods due to natural calamities or man-made causes.

Related aspects to be considered are, besides the greening of ports and transport (see topic 1 above), security, urban congestion, energy efficiency and, on a more geostrategic view point, the creation of a “Mediterranean Motorways of The Seas” approach including⁽⁷⁾ organizational, financial and training aspects as well as logistic platforms.

Overview of relevant programmes/projects/actions

As far as R&D is concerned, similar considerations as provided for topic 1 apply. On the matter of cross border (and infra Med) institutional cooperation, the GTMO⁽⁸⁾ (Groupe des Ministres de Transport de la Mediterranee Occidentale) is a major initiative and source of relevant information. Reference is made, for instance, to the assessment study of the logistic sector in Maghrebian Countries⁽⁹⁾ produced by CETMO (Technical Secretariat of GTMO) which underlines that the high logistic costs (around 20% of GDP) can be reduced thanks to a combination of governmental initiatives (including training), enhancing Public Private operations and, in general, modernisation of the sector.

2.3. City development and urban mobility

Gaps to be addressed and problems to be solved

The development of the traffic of goods between harbours and logistics hubs or distribution centres will affect urban transport infrastructure in harbour cities and major cities. Proper balance between economic development (and associated urban growth) and increased urban congestion is necessary to ensure a high quality urban mobility.

Within the EU, main drivers for this topics are Europe 2020 (CO2 related) initiative, the SET plan and the “Smart Cities” initiative.

Some 72% of the EU population is concentrated in cities (probably an higher figure applies to non EU Med population), hence an environmentally smart city approach (based on smart grid, sustainable buildings, smart mobility, etc.) would enable significant reduction of environmental impact. To achieve this, however, port and urban developments shall be seen in an integrated way rather than in isolation (as it is normal practice today).

Examples of Port-City integration are:

- interoperability of urban (infomobility) and maritime ICT systems;
- incentive schemes promoting cargo shift from road to sea;
- LNG fuelled ships, electricity shore supply and OTHER pollution reduction strategies
- vessel traffic management services (VTMIS) properly integrated with urban systems.

Besides port city integration, considerable work has been done on city logistics and mobility management. Related main challenges are as follows (note that figures are for Europe):

- *Challenges for Urban Mobility:*
 - Urban areas produce up to 85% of EU’s GDP
 - Efficient transport is vital for economic growth and employment in urban areas
 - Urban areas face particular challenges in making transport sustainable
 - Urban mobility is of growing concern to citizens
 - Urban mobility is a central component of long-distance transport
- *Problem to be solved:*
 - Congestion: costing 1% of GDP annually
 - Health issues: local air pollution and noise

- Safety and security: 2/3 of road accidents, 1/3 of road fatalities in urban areas
- Climate change: 40% of CO2 emissions of road transport in urban areas (In Europe, urban mobility accounts for 40% of all CO2 emissions of road transport and up to 70% of other pollutants from transport).
- Energy consumption: domination of oil as a transport fuel

Overview of relevant programmes/projects/actions

On R&D aspects, basically the same considerations provided for topic 1 apply. As far as EU policies and strategies relevant to (Urban) Transport Research, the following is worth noting:

- **EU Research policy (incl. Innovation)**
 - The 7th Framework Program (FP7) 2007- 2013 (Transport Theme)
 - COM on the “Innovation Union” (Oct. 2010) with focus on major societal challenges and on European Innovation Partnerships (EIP)
 - Green Paper on Common Strategic Framework (Feb. 2011)
- **EU Transport Policy**
 - Transport White Paper 2010-2020 (March 2011)
 - Strategic Transport Technology Plan (Summer 2011)
 - Urban Mobility Action Plan (Sept.2009)
- **Other relevant inputs**
 - European Economic Recovery Plan (Nov. 2008)
 - Europe 2020:

3) Definition of the main elements for a medium to long term agenda of Euro-Mediterranean Cooperation in Research and Innovation:

- Specific objectives in relation to the topics;
- Main intervention strategy: including national, regional perspectives and the role of international cooperation activities;
- Specific actions and instruments: including range of actions and instruments necessary to achieve the objectives e.g. training, technology transfer, capacity building, support to reforms, investment opportunities for business, etc.

3.1. Competitive, green ports and hinterland connectivity

Specific objectives

Ports as key enablers in:

- fulfilling future emissions regulations (SOx, NOx), e.g. by providing LNG refuelling facilities for ships and/or shore side connections
- complying with “clean water” types of requirements, e.g. by ensuring waste water reception facilities and shore based waste water treatment

Main intervention strategy

A common approach at Mediterranean level is necessary in order to ensure uniformity (same standards) and compatibility (interoperable solutions).

In this respect an interesting project concerning port performance is the PPRISM project (<http://pprism.espo.be/>). The idea behind PPRISM is to allow EU ports to benchmark themselves to an EU average. This should stimulate the ports to achieve at least the average or better. Over the years ports should learn from other experiences and bring the performance levels to a higher level. The port observatory/dashboard developed in this project, will allow to follow-up on the development and performance of European ports. This has been done by developing a series of indicators around 5 axes: (1) market trends and structure, (2) socio-economical, (3) environment, (4) logistic chain and operational performance (e.g. interconnectivity) and (5) governance.

In the short term, focus on pre-deployment based on shared results of (past) R&D projects.

Specific actions and instruments

Develop the Mediterranean Motorways of the Seas with similar goals to the EU TEN-T scheme.

Promote full scale demonstration projects aiming at providing decision makers (National Administrations, Port Authorities, etc) with proven best practices in the use of mature technologies and at defining:

- a EU wide masterplan for green technologies/green retrofitting
- suitable common standards for deployment

Promote a Mediterranean common “Knowledge Management” both in terms of shared R&D results and in terms of common training schemes on new technologies.

Re-focus ENPI Med programme to cover some of the above challenges.

3.2. Transport network and logistic network

Specific objectives

Optimisation of the logistic chain along whole “corridors” extended to cover the Mediterranean Basin and its hinterland aiming at improving the capacity, frequency or quality of existing maritime links, or establish new ones, as elements of a broader network.

Main intervention strategy

Definition of corridor-specific needs in terms of pre-deployment (short term) and R&D (medium-long term).

Specific actions and instruments

Same considerations provided for topic 1 apply.

3.3. City development and urban mobility

Specific objectives

Develop Sustainable Urban Mobility Plans and dedicated activities e.g. on city logistics, infrastructure development and advanced public transport systems. This could include the Integration of Port sustainable development in the Smart City approach

Main intervention strategy

Same considerations provided for topic 1 apply.

Specific actions and instruments

Exchange of best practices; coordination and support activities; dedicated R&D cooperation going up to demonstration.

1.1.1.1.1.1.1.1 References

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⁽²⁾ H. Journee – “From Port Environmental Management to Sustainable Logistic Chain Management in practice” – Green Tech 2010, Montreal

⁽³⁾ IMO, 19 September 2011, FAL37/17 – Report of the Facilitation Committee at its 37th session.

⁽⁴⁾ DIRECTIVE 2010/65/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on reporting formalities for ships arriving in and/or departing from ports of the Member States and repealing Directive 2002/6/EC.

⁽⁵⁾ http://www.oecd.org/document/38/0,3746,en_2649_37429_48229222_1_1_1_37429,00.html

⁽⁶⁾ DECISION No 661/2010/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 7 July 2010 on Union guidelines for the development of the trans-European transport network, http://ec.europa.eu/transport/infrastructure/index_en.htm

⁽⁷⁾ M. El Khayat – “Enjeux des chaines logistiques maritimes de la rive sud de la Mediterranee dans la construction d’une zone economique euromediterraneenne.

⁽⁸⁾ GTMO – Bilans des Activites du GTMO et de la Cooperation Transports en Mediterranee Occidentale, 1997-2006, Tunis 2 mars 2007.

⁽⁹⁾ The Logistic Sector on the Southern Shores of the Western Mediterranean, Study funded by the European Union through EuropeAid and by CETMO.

⁽¹⁰⁾ COM (2011) 415 final 7.7.2011

⁽¹¹⁾ COM (2011) 303 25/05/2011

1) Proposed topics to be covered:

- *Mediterranean sea environment: challenges & opportunities*
- *Pressures in the Mediterranean sea environment*
- *An Ecosystem based approach for fisheries and aquaculture*

2) State of play

2.1. Mediterranean sea environment: challenges & opportunities

The Mediterranean Sea is a semi-enclosed basin with unique characteristics that are being affected by three seas and oceans with very diverse features: the Atlantic Ocean to the west, the Black Sea to the north-east and the Red Sea through the Suez Canal to the southeast. It is characterized by a combination of coastal and open sea dynamics and has been often referred to as a “miniature ocean” and a “physical laboratory” for marine environmental research.

The Mediterranean Sea appears to be one of the richest European region, in terms of species diversity. Its thermal excursion is great, with the spatial (but not temporal) coexistence of two types of biota: a cold-temperate one in the cold season (at least in the coldest parts of the basin) and a tropical one in the warm season. This high diversity richness is attributed primarily to the eventful geological history and to the large variety of habitats present in the region. Changes in the marine biodiversity have been documented in many parts of the region and are attributable both to natural phenomena, global change and anthropogenic activities. Research has shown that changes in biodiversity may well affect the ecosystem functioning, even in the case of invasions by a single species, with important consequences both to nature and society.

“By 2020 the Mediterranean Marine Science should be able to contribute with New Knowledge to efficient Policy Making and sustainable growth of Maritime Economy in response to the societal challenges for Food, Energy, Wellbeing, and a Healthy marine environment following the principles of Ecosystem Approach to Management of Natural Resources”

(Mediterranean Strategic Research Agenda, SEAS-ERA, February 2012)

2.2. Pressures in the Mediterranean sea environment

There is increasing evidence that the Mediterranean environment is undergoing changes of transient and/or long lasting nature. The drivers of changes are related to both natural and man-induced pressures, are closely interlinked with each other. At the large (basin) scale, climatic variability, affected by the anthropogenic atmospheric emissions of “greenhouse” gases impacts the physical dynamics and hydrological (water mass) structure. Together with variability in fresh-water, nitrogen and phosphorus, atmospheric and land-based (point and diffuse) inputs, nutrient concentrations and ratios have changed and the biogeochemical state of the Mediterranean ecosystem is evolving and conditioning/constraining (along with the physical variability) the local spatial structure and temporal variability of the lower trophic level web. The greenhouse effect related to progressive warming of surface ocean waters is causing a northern extension of the warm-temperate species against the recession of the cold-temperate, suggesting a meridionalization trend. Exotic species, mainly of sub-tropical origin, favoured by temperature increase are now well-established. In addition to such findings, the EU-FP6 SESAME project carried out large-scale studies exploring the occurrence of alien species into the Mediterranean and Black Sea ecosystems in relation to observed surface ocean warming and how these affect ecosystem balance.

UNEP-MAP’s Integrated Assessment of the Mediterranean Ecosystem Report, identified in 2012 the following major anthropogenic pressures and impacts that cause degradation of the Mediterranean

Ecosystem: coastal development and sprawl; overfishing and destructive fishing; contamination of sediment and biota by pollution caused by urbanization and industry; nutrient over-enrichment; disturbance and pollution caused by maritime industries; invasive species spread; and degradation of transitional and estuarine areas.

More specifically, the global changes, which could have adverse effects on populations and ecosystems across the Mediterranean are population growth, tourism, industry, urbanism, transportation and agriculture.

- Population growth: Today, 82 million people live in coastal cities. Blue Plan of UNEP-MAP estimates that by 2025 there will be 150-170 million people living there. Today the southern countries account for 32 per cent of the region's population; by 2025 that is expected to have reached 60 per cent.
- Tourism: Over 100 million tourists flock to Mediterranean beaches every year and this number is expected to double by 2025, bringing huge seasonal population pressures.
- Industry: The United Nations Environment Program has estimated that 650 million tons of sewage, 129,000 tons of mineral oil, 60,000 tons of mercury, 3,800 tons of lead and 36,000 tons of phosphates are dumped into the Mediterranean each year.
- Urbanism: 70 per cent of the urban wastewater is being dumped into the Mediterranean untreated.
- Transportation: The sea is a major oil transportation route with more than 100 large tankers sailing at any time. There is risk from accidental spills, illegal bunkering and tank cleaning practices. Agriculture: Pollution also reaches the Mediterranean through its major river systems: the Po, the Ebro, the Nile, and the Rhone which carry substantial amounts of agricultural and industrial wastes.

However, there are many opportunities emerging. International (led by UNEP-MAP and EU, and assisted by World Bank and other IFIs) and regional conscience is seeking solutions and funds for the environment.

2.3. An Ecosystem based approach for fisheries and aquaculture

The Mediterranean Sea contains some six per cent of the world's marine species. Some of the world's most endangered species, such as the monk seal, can be found in the Mediterranean. Fish stocks are down to 20 per cent of natural levels in some areas, and the Mediterranean is now a net importer of fish. The phenomena of invasive species are a reality. There is also the arrival of new tropical Atlantic species from the tropical Atlantic. This reflects an expansion of the natural area of these species that now enter the Mediterranean through the Gibraltar strait, because of a warming trend of the water. An ecosystem approach of fisheries is thus a necessity.

Pressures exerted from fisheries are quite unknown in the area; therefore knowledge of fisheries needs to be improved. Quality of fishery statistics still one of the main weaknesses and the production of good quality statistics is a major priority. Over-fishing and its effects is a real problem for sustainable ecosystems in the Mediterranean Sea as fishing down the marine food web has a negative impact on entire ecosystems, an important factor of change for the Mediterranean, acting independently from climate change related issues and certainly deserves attention.

Finally, another important issue of Mediterranean fisheries is the high level of by-catch species which results in large amounts of discards, produced mainly by mobile bottom fishing gears, which also disrupt food webs and trigger profound changes at the ecosystem level. Furthermore, over-fishing of important bluefin tuna and swordfish fisheries existing in the Mediterranean has increased the vulnerability of these stocks, raising concern about their high exploitation rate which is reflected in progressive decreases in mean size and mean age at capture. Aquaculture development has also to be re-examined through a global approach taking consideration of advantages and environmental risks.

2.4. Most important issues to be focused on:

Gaps still to be addressed and problems to be solved:

- When focusing on anthropogenic pressures on the coastal zone, one encounters lack of consistent and reliable scientific knowledge and information on many processes and phenomena, which is essential for policy and decision-making. The Transboundary Diagnostic Analysis, prepared by UNEP-MAP in 2002, as well as several other national and international initiatives in the Mediterranean Basin, identified more than 100 coastal ‘hot spots’ that deserve special attention in the future: i.e. the Spanish coast, the Gulf of Lions, selected coastal areas in the Ligurian Sea, the northern Adriatic Sea, some enclosed gulfs in the Aegean Sea, the Nile Delta, etc.
- The sustainable use of non-living marine resources and the pressures exerted from these activities is very important in the Mediterranean today as significant questions on the regional and global (worldwide) importance of fluid vents and associated gas hydrate accumulations are still pending. Seabed and habitat mapping should be made at basin scale and identify and study the seepage ecosystems giving rise to Ecosystem’s research on mud volcanoes.
- *Although nowadays the scientific information in hand is vast when compared to the past, we still need to translate scientific information into precise conclusions and guidelines to support adequate political decisions and hence more actions from the scientific community need to be done.*

In particular:

- More information is still required on the variability of biodiversity at different scales (from local and meso-scale, to the seascape level). Hypotheses at these scales such as whether the local species pools are random samples from the regional species pools, still need to be tested.
- There is still limited knowledge on the role of physical processes in the development and maintenance of biodiversity. The identification of suitable locations for the study of the physical processes that control marine biodiversity constitutes a major gap to this end.
- A cross-nation effort to establish baseline information for assessing historical trends in marine biodiversity is required.
- The effects of anthropogenic impacts (eutrophication, environmental stressors and micro pollutants) on both the structural and functional aspects of biodiversity are of particular interest for the region. Accurate methods and tools are required to detect changes at the regional, coastal and national scales. The potential of recently developed research fields in the marine science, such as microbial-molecular parameters and the trophic breath should be tested. The development of indices integrating both ecological and social values is urgently needed.
- A considerable gap still exists in the coupling of classical and molecular techniques in the study of biodiversity. Classical taxonomy could benefit from the recently developed molecular and genetic techniques, which would allow for testing hypotheses already in place

2.5. Overview of relevant programmes/projects/actions

Despite important differences of capacities between countries, Marine Science has always played an integrating role and promoted the regional cooperation in the Mediterranean Sea. Important stakeholders in this process are the regional commissions (e.g. CIESM and MedGOOS) and conventions, the most relevant being the Convention for the Protection of the Marine Environment and the Coastal Regions of the Mediterranean (‘Barcelona Convention’), together with its protocols.

Within or outside the above frameworks, the marine research community has a long tradition of collaboration, especially with the support of the earlier EU FPs, where specifically targeted project calls on the Mediterranean were launched and a number of important projects were developed. A series of research infrastructure development and other projects have strong Mediterranean components (e.g. EUROSION,

COSCIENCE, PEGASO, EuroSITES, EuroFLEET, SEADATANET, GROOM and JERICO). A number of projects have also been under the ESFRI initiative (e.g. EMSO, EuroARGO, EMBRC). PERSEUS is focusing on Policy-Oriented Marine Environmental Research in the Southern Seas.

A number of projects are working to address the need to provide valuable data (e.g. CoralFISH <http://www.eu-fp7-coralfish.net/>, HERMIONE <http://www.eu-hermione.net/>). MEDISEH - Mediterranean Sensitive Habitats under the MAREA umbrella is collating historical and current data, in GIS, on the 3 main protected habitats under Council Regulation (EC) No 1967/2006: seagrass beds, coralligenous habitat and mäerl beds. There are also a number of excellent national initiatives such as the Italian regional scale seafloor mapping and geohazard identification project MaGIC (Marine Geohazards along the Italian Coasts).

Two important initiatives that are relevant both to MSFD and habitat mapping and intended to overcome fragmentation and non-standard data collection at the European Union level are the European Marine Observation and Data Network (EMODnet) and WISE-Marine. EMODnet has been established to collate fragmented and inaccessible marine data into interoperable, continuous and publicly available marine environmental data streams for complete maritime basins. Data collection strategies will be improved by the WISE-Marine initiative that will provide a comprehensive and shared European data and information management system for the marine environment which supports implementation of the Marine Strategy Framework Directive. This will also include the use of the EMODnet and INSPIRE processes to establish the required infrastructure and data access.

The respective collaboration between national Research Funding Organizations (RFO) in the Mediterranean Sea is less developed and most initiatives were, until recently, on a bilateral level. The EU INTERREG, the EraNET scheme, the INCO initiative have been barely used for addressing the regional marine challenges. Recently, the overarching ERA-NET SEAS-ERA “Towards integrated European marine research strategy and programmes” has been established for strengthening marine research across European Sea Basins, namely the Atlantic, Mediterranean and Black Sea.

3) Definition of the main elements for a medium to long term agenda of Euro-Mediterranean Cooperation in Research and Innovation

3.1. A basin wide role for the Marine Strategy Framework Directive?

Implementing the ecosystem approach in the Mediterranean Sea presents a unique set of problems due to the complexity of geopolitical environment and the diversity of maritime interests of the 22 littoral states, the majority of who are not EU Member States. With regards **ecosystem boundaries**, practical difficulties arise when the boundaries of the ecosystem do not correspond to the maritime jurisdictional zones set down by the Law of the Sea (Long, 2012). The resulting mismatch between ecosystem boundaries and the boundaries of the various maritime jurisdictional zones as codified in the 1982 LOS Convention may mean that the rights and duties of various parties vary across the ecosystem. Frequently, these difficulties are compounded by the absence of a single regulatory body with exclusive legal competence to adopt management measures that apply to the entire ecosystem. As a result, cross-boundary cooperation at global and regional levels is essential to implementing the concept in practice (Long, 2012).

At the level of the European Union, the Marine Strategy Framework Directive (MSFD) is the legal instrument that applies the Ecosystem Approach to the marine environment, adopting an integrated approach that encompasses environmental pressures and impacts and the integration of the environment and human activities. The MSFD relies heavily on regional cooperation and places an obligation on European Union Member States to work in a regional context. It has therefore an obligation to work with regional seas initiatives with a view to the achievement of good environmental status (GES). The development of a set of (operational) ecological objectives with indicators and target levels based on the 11 MSFD descriptors and GES and corresponding to the Vision for “a healthy Mediterranean with marine and coastal ecosystems that

are productive and biologically diverse for the benefit of present and future generations” and the Strategic goals is underway.

Impediments to extending MSFD basin wide in the Mediterranean as an overarching framework for the delivery of ECAP should be identified. This has already been discussed to some extent at the 2nd Meeting of Technical Experts on the application of the ecosystem approach in 2010.

The Strategic Partnership for the Mediterranean Sea Large Marine Ecosystem (MedPartnership) aims to enable a coordinated and strategic approach to catalyze the policy, legal and institutional reforms, and the necessary investments to reverse the degradation trends affecting this large marine ecosystem, including its coastal habitats and biodiversity. The project is being implemented in close association with other relevant initiatives, such as Horizon 2020 for the de-pollution of the Mediterranean, the Integrated European Maritime Policy, and the World Bank/GEF Sustainable Mediterranean Program.

3.2. Is there a need for Large Scale Coordinated Habitat Mapping?

There is a recognized lack of habitat mapping data in the Mediterranean, including the priority habitat Posidonia meadows and deep-sea corals, and sub-regional biases and differences in mapping or sampling effort exist (see for example the EUSeaMap Preparatory Action for development and assessment of a European broad-scale seabed habitat map project featuring the West Mediterranean).

There is a need for more habitat mapping/habitat suitability modelling in combination with regional multibeam bathymetry surveys to lay the foundation for marine spatial planning. Commissioner Damanaki at the recent European Parliament workshop "Knowledge for a better understanding and use of resources: the case of mapping the seafloor" referred to a number of initiatives carried out under the umbrella of 'Marine Knowledge 2020' that could be considered to be the first steps towards a complete mapping of the European seabed by 2020. Commissioner Damanaki said "*Data and information gathered through seabed mapping can help define marine protected areas and help business to take informed decisions on investments in marine and maritime activities. But these are just examples, showing how the mapping the seafloor is of great importance both for the EU Common Fisheries Policy and our maritime policy*".

A possible Grand Challenge could be to carry out a shared Mediterranean multibeam survey of the deep-waters (>200m) of the entire Mediterranean Basin or at least the area in the High Seas. This would provide a common resource¹ linking all the countries of the Mediterranean.

3.3. Can Conservation of Biodiversity Initiatives Be Strengthened?

The OSPAR Commission in its 2010 Status Report for the NE Atlantic concluded that the “management of human activities in the marine environment has not paid enough attention to conserving biodiversity.” In March 2010, the leaders of the EU acknowledged that the 2010 global biodiversity target would not be achieved and agreed a new target of halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020 with a longer-term vision for 2050. Subsequently, the European Commission published the EU Biodiversity Strategy to 2020 that sets out a blueprint on how this will be achieved under various EU policies over the coming decade.

As noted by de Juan and Leonart (2010), there is a common failure to enforce fisheries regulations due to the large number of countries involved and the fact that almost half of the Mediterranean can be considered as High Seas, or international waters. Many marine ecosystems are currently threatened by fishing activities, such as bottom trawling, gillnets and demersal and pelagic long-lines. Especially vulnerable are areas described as either sensitive habitats or essential fish habitats. Among these we highlight the associations of sessile organisms, such as cold coral reefs, mostly detected on continental slopes, seamounts and on the walls of submarine canyons, and those areas considered as hot spots of diversity and habitat of vulnerable fauna, like cold seeps, hydrothermal vents and submarine canyons. Essential habitats for pelagic species are defined by oceanographic features like productive areas associated with upwelling, and in the Mediterranean the spawning areas and migratory routes of bluefin tuna, swordfish, and albacore are of high conservation interest.

To illustrate one of the difficulties, the COUNCIL REGULATION (EC) No 1967/2006 concerning management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea, includes articles:

(9) “ The strict protection of certain marine species already afforded by Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora and applicable to marine waters under Member States' sovereignty should be extended to the Mediterranean High Sea”.

(10) “Pursuant to Council Decision 1999/800/EC1 on concluding the Protocol concerning specially protected areas and biological diversity in the Mediterranean, and on accepting the annexes to that Protocol (of the Barcelona Convention) which, in addition to the provisions relating to the conservation of sites of Mediterranean importance, provides for drawing up lists of endangered or threatened species and species whose exploitation is regulated”. Both of these articles could be used to protect cold-water corals both within national jurisdiction and in international waters. But this hasn't happened as yet. There is also the problem that monitoring, control and enforcement measures vary greatly throughout the Mediterranean and are not (or rarely) applied in the High Seas (see Cochrane and de Young, 2008). In their article, de Juan and Leonart (2010) propose that in a context of the difficult fisheries management in Mediterranean international waters, or high seas, vulnerable habitats should be protected through the establishment of a network of Marine Protected Areas coordinated by all the involved countries and controlled by strict (**and shared**) surveillance.

Finally, it is worth noting that the Norwegian Barents Sea Integrated Management Plan has successfully established a number of the policy tools mentioned above, such as, area-based management, species management, ecosystem indicators, monitoring, and risk evaluation. The identification of valuable and vulnerable areas, though an topic of some debate during the plan's development, is also considered a centerpiece of the plan. The Plan provides a foundation for co-existence of key industries (fishing, petroleum) as well as measures for addressing pollution and maintaining biodiversity (cf. MedWaves no.58).

Priorities for Action

Contributions of marine research to address these challenges relate to:

- Knowledge: Provide the latest scientific knowledge on a series of climate change topics; oceanographic indicators on sea circulation and waters hydrodynamic
- Information: Publish and share data on climate variability and weather extremes; Peer-reviewed research articles covering a broad array of topics in physical, biological and chemical oceanography; The Bluewater and Climate Node have research interests; Draw on peer-reviewed literature of researchers; Build an integrated marine observing system
- Education: Marine research institutes will develop modules for fisher men and decision makers
- Networks: Develop a large network of marine research centers and universities for a benchmark on best practices; Build new partnership for Programs and Projects by mixing teams and equipments.

Over the next decades, the focus should be on the following:

- *Policy oriented options should be clearly upfront, be applied and enhanced. Science should help by providing timely and accurate information, so decisions for the future will best taken.*
- *Synthesis of the current findings of features of the Mediterranean Sea with their bio-ecological conditions should be used to develop a series of evaluations and projections on the possible future of ecosystems (SESAME IP Project has initiated this kind of approach).*

- *On the other hand coastal systems must be regularly monitored. The implementation of the Marine Strategy Framework Directive (MSFD) could help, as long as the concept is promoted and realised also by non-EU countries. Scarcity of data is probably one of the main issues. There are large stretches of coastal zones, with sparse records (e.g. South Mediterranean, but not only). Processes, pathways and fate of pollutants are not well known (many past data exist, but not the pathways...).*
- *Problems of microbial pollution in the coastal zone persist and are mainly related to urban wastewater, especially in the south coast. Sources of pollution and anthropogenic pressures must be identified (e.g. non-point sources in agriculture) and the biological effects of long-range pollutants must be ascertained.*

The main objectives to be attained are the following:

- Strategic planning, by preparing an inventory of existing science and technology plans and priorities in the countries represented in the consortium, and Strategic Research Agendas (SRA) for the European Sea Basins.
- Joint research activities, to foster synergies at regional and pan-European level, mobilising competitive and non-competitive funds for research through common programs and joint calls.
- Marine Research Infrastructures (MRIs) Plan, for a better and sustainable use of the existing MRIs.
- Human capacity building for the development of ocean-related activities in order to improve science development and its utilization in Europe and reduce imbalances among regions.

These general objectives will be first implemented at the Sea Basin scale as a step forward in building the overarching pan-European strategy.

With an overall objective to deliver new knowledge and tools in support of a sustainable economic growth and a healthy Mediterranean marine environment, the specific strategic objectives and expected benefits of the Mediterranean SRA can be summarized as follows:

A. Improve our understanding of Mediterranean Sea functioning and evolution

The Mediterranean Sea is a complex system with active physical biochemical and geological dynamics controlled to a large extent by its interactions with atmosphere, the catchment area and the neighbouring seas as well as by the various anthropogenic impacts. There is increasing evidence that the Mediterranean Sea is undergoing changes of transient and/or long lasting nature in response to both natural and man induced pressures, closely interlinked with each other. Understanding how the Mediterranean functions and responds to external forcing is a prerequisite for efficient management of its resources and implementation of policies. Despite the progress of the last decades in Mediterranean marine research, through coordinated international and EU funded research programs, there are still major knowledge gaps especially related to the emerging challenges, such as climate change, water cycle variability, deep sea dynamics or system evolution at long time scales. Coordinated research and investments in long term sustained observations and improvements of shared databases and models are needed in order to fill these knowledge gaps and reduce the uncertainties of our understanding.

B. Support sustainable economic growth in the region

The economy of Mediterranean riparian countries depends significantly on maritime activities. Tourism, maritime transport, fisheries and mariculture are important sectors contributing to more than 20% in some cases to national GDP. Emerging economic sectors include marine renewable energy, biotechnology and deep sea hydrocarbon exploitation. New research is needed to make exploitations of these goods and services sustainable and more efficient. This type of research, calls for new partnerships between public research institutions and the private sector that needs to transform new knowledge into economic growth through emphasis on innovation. The traditional role of industry as end user of selected scientific results is no longer valid and initiatives must be taken for common investments in targeted topics of high potential. Being aware of sectoral Strategic Research Agendas that have been developed over the past years (e.g. maritime transport, aquaculture and renewable energy sectors), SEAS-ERA puts emphasis on the relevance of these economic activities for marine environmental research, where appropriate, aiming at enhancing sustainability and applying the principles of Ecosystem Approach to Management.

C. Support knowledge-based policy making and management

A series of regional and pan-European policies are relevant for the Mediterranean Sea including the Integrated Maritime Policy (IMP), the Marine Strategy Framework Directive (MSFD), the Water Framework Directive (WFD), the Common Fisheries Policy (CFP) and the Barcelona Convention and its Mediterranean Action Plan (UNEP-MAP). These policies have set a series of monitoring obligations to contracting parties but have also introduced new research needs in specific areas. This is especially the case for the recently implemented MSFD that calls the EU member states to implement the necessary measures in order to maintain or reach Good Environmental Status (GES) of our seas. This requires the best available scientific knowledge about the ecosystem and its dynamics, the assessment of the environmental quality as well as an analysis of the drivers as human activities that lead to pressures on the environment. This should be carried in an integrated ecosystem-based way, an approach which is still not well developed and implemented in the Mediterranean. Although the implementation of MSFD is a national obligation, the Mediterranean SRA considers MSFD as an overarching driver and a major priority recognizing the important gaps that exist in southern European seas.

D. Develop new capacities and promote convergence between Mediterranean countries

Capacity building is an important element in marine sciences either as infrastructure development or as training and education. This is especially the case for the Mediterranean Sea where important differences exist between capacities of the northern (European) and south-eastern (African and middle-East) countries. This applies to both research infrastructures (laboratories, ships, observing platforms etc) and human capacities at all levels (technicians, postdocs, mid-career) especially when training in new technologies is considered. The issues of infrastructure sharing and human capacity building with training in new technologies are considered a priority that should be implemented. This is expected to lead to a more homogeneous and competent Mediterranean marine research community able to support new developments in science and a future knowledge based economic growth in the region. Furthermore, the development of a Citizen Science Reporting System for gathering environmental information and for raising public awareness on issues such as biodiversity, ecosystem services, health and socioeconomic values will be explored. A Citizen Science Reporting System is a complement to formal environmental monitoring and surveillance.

Main orientations for the future

The development of sustainable maritime economies and effective coastal management requires policies built on foundations of best available scientific knowledge. To address the above strategic Grand Challenge, international scientific co-operation needs to be strengthened. Further cooperation with Mediterranean non-EU countries, through joint programmes and capacity-building, should be particularly improved. As indicated in the communication from the Commission “Towards an Integrated Maritime Policy for better governance in the Mediterranean” (COM-2009, 466), a major multilateral research effort, targeted at integrating knowledge on the Mediterranean Sea across all relevant disciplines should be developed.

To this end, the implementation of specific mechanisms of co-operation should be explored, namely:

Paying particular attention to the Mediterranean in setting-up an integrated marine ERA-NET aimed at strengthening coordination in marine research between Member States.

Defining a long-term strategic framework for basin-wide scientific co-operation in the Mediterranean, enabling marine research co-operation to develop within a structured agenda, responding to agreed common challenges.

The Mediterranean SRA will need to address the following priorities:

- Improve our understanding of Mediterranean Sea functioning and evolution
- Support sustainable economic growth in the region
- Support knowledge-based policy making and management
- Develop new capacities and promote convergence between Mediterranean countries

Parallel session 6: Strengthening innovation in the Mediterranean region

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1) Proposed topics to be covered:

1. *Enhancing cooperation between public research organisations and industry*
2. *Networking initiatives to develop innovation in the Mediterranean region*
3. *Financing facilities to strengthen the innovation chain*

2) State of play

The main problem shared by all countries in the Mediterranean, are the uncertain economic perspectives and the devastating job situation. A large share of the youth population is currently unemployed, increasingly also highly skilled and trained graduates from universities and technical higher education institutions. In this context, innovation and research are facing two central challenges: Firstly, to keep up and further support excellent research and teaching institutions. In economic and political difficult times, this becomes an even more difficult task. Cutting down education and research budgets is often a consequence, however, this must not happen. The second challenge is to find the balance between excellent and frontier pushing, basic research, on the one hand side, and the development of marketable ideas and innovation on the other hand side. This balance is essential in order to create new knowledge that future generations will be able to draw on and to (further) develop the urgently needed innovative and entrepreneurial skills that will help the young generations to be able to create new jobs.

With respect to these challenges, the Arab Mediterranean (MED) countries¹ face two main problems: limited technological and innovative capacities (Brach 2009; Brach and Naudé 2012), and a weak culture of innovation (Pasimeni et al. 2007). Despite the fact that Euro-Med cooperation in the past never explicitly concentrated on strengthening innovation and research, different initiatives have dealt with and supported these topics. However, the participation of Mediterranean countries in scientific cooperation with the EU has been very low. Less than 1 percent of the allocated contributions and only 10 out of 220 contracts were signed with MED countries in the Fifth Framework Programme (FP) (EC 2005). Only three MED countries: Tunisia, Morocco and Algeria were involved. The range of countries was significantly expanded in the FP6 (2003-2005) to include eight countries (the three North African countries plus, Egypt, Jordan, Lebanon, Syria and the Palestinian Territories) and yet the participation of MED countries remained low in an international comparison (cf. Pasimeni 2007). However, the documentation and availability of coherent data is very difficult to access. To the best of our knowledge, no systematic overview of the evaluation of key figures of interest such as the number of contracts and contracting partners, or the share of the funds allocated by developing region was available. The same is true for innovation and research indicators, as for example business enterprise expenditures for research and development, number of publications, the number of researchers and others that are regularly compiled by the Commission's joint research center which are not available for the MED countries (Joint Research Center 2012).

Several reasons are partially accountable for the low participation and success rate: A lack of tailor-made policy instruments that are fitted to the situation that these countries are facing and that are directed at solving central problems. As a result of lacking capacities, and skills as well as a low prioritization of research and innovation by the political actors, in the MED countries, there seems to be very little strategy for directing the innovation towards developing new capabilities and entering new, more sophisticated markets based on the existing know-how. The argument concerning a lack of feedback and evaluation mechanisms applies here too. Only rarely is relevant data available and if so, this knowledge is rarely used to improve the design and/or implementation of new initiatives (IBRD 2011).

Certainly also, the difficult political situation currently hampers innovation and research cooperation at the state level. Yet, given that the public institutions in the past did not very successfully promote innovation systematically, new freedoms for the private sector and new private actors in this field are therefore important new opportunities.

Another, more structural problem of Euro(Med) research and innovation cooperation is, that European support for research, development and innovation has become too complex (European Commission 2011). The multitude of national, regional, multilateral and bilateral initiatives are not aligned, poorly visible and accompanied by high administrative burdens and information asymmetry on the side of the potential beneficiaries.

This is also the reason why no exhaustive, official overview of past projects in related areas is available. Therefore, we have to limit ourselves to a briefly presenting some more general data and to highlighting those programmes/projects/actions that at least the participants of the session were/are aware of. 4 projects were jointly identified:

ESTIME – FP6-510696/510606: Evaluation of Scientific, Technology and Innovation Capabilities in the Mediterranean Countries

ASBIMED – FP6- 510659: Assessment of the bilateral scientific co-operation between the European Union Member States, Accession, Candidate and Mediterranean Countries

MIRA –FP7: Mediterranean Innovation and Research Coordination Action promoting Euro-Mediterranean cooperation in RTD and facilitation of the interaction with existing programmes on Innovation in the Mediterranean Area, such as the “Euro-Mediterranean

Industrial Cooperation 2009-2010 Programme” (DG Enterprise and Industry), the Enterprise Europe Network, and the Network ANIMA.

3) Definition of the main elements for a medium to long term agenda of Euro-Mediterranean Cooperation in Research and Innovation:

The **three key objectives** for Euro-Mediterranean Cooperation in research and innovation are:

First, **bringing research and innovation closer together** and aligning existing programmes and initiatives at the level of the European Union, at the level of Euro-Mediterranean relations, and at the level of the Mediterranean countries.

Second, **unleash the innovative potential in the MED region** and to make direct use of research and innovation for socio-economic development in MED region in the medium and long term. Innovation is widely and correctly considered as the key driver of sustainable economic development.

And, thirdly, **fit research and cooperation to strengthen innovation and marketable knowledge** in the Mediterranean region. Research is the art to question, analyze and reflect the status-quo and to push the knowledge frontier. As such, research is an important ingredient and determinant of the innovation process. Innovation always needs research.

Depending on the scope, size and complexity of (process, product and policy) innovations, research can either be necessary in research-intensive, high-technology areas. Or, as is the case for most innovation at the firm level, it often needs much less radical measures to be taken – and is also less expensive and explicit. Incremental innovation and (technology) adaption at the broad basis, i.e. strengthen and upgrade the capacities of actors in the public, private, research and education sectors to use, apply and modify technologies, products and techniques that have been already been developed needs to be strengthened.

Future success of Euro-Med cooperation in this field, needs a strategic perspective and concerted action, directly involving the stakeholders. This in return requires informed decision making based on detailed knowledge and understanding of the real needs at the local and national level.

Micro-level empirical evidence and market dynamics are necessary to complement political considerations.

In the context of the three topics, three *specific objectives* have been identified and will be discussed in session:

- *Improve interaction and flow of information:* The dissemination of research results and the benefits for the societies from research mainly depend on two aspects: the quality of the (public) research institutions and the one hand side, and the interaction and communication between research institutions and the industry and political on the other. Although the link between research and marketable ideas and innovations is much more straightforward in technical, natural or medical sciences, the same importance applies to political and social sciences (including economics).
- *Expand and deepen specialized and sectoral networks:* close interaction and exchange of knowledge and ideas across and around the Mediterranean needs to be increased significantly in quality. Time and resource consuming duplication of research and innovative effort can be reduced and redirected towards productive validation/falsification and modification of generated knowledge. Transparent and dynamic, open networks are difficult to manage, but the reward for and potential benefit of concerted action for the societies is very high. The aim is to actively join forces to overcome common problems, not cooperation for the sake of cooperation.
- *Prioritize financing of innovation and entrepreneurship:* a major constraint to innovation in the Mediterranean countries are the capability to foster the transfer of technological capacities and a miss-match between the content of (higher) education and the skills need by the industry. The medium and long-run return on investments in these areas, from an EU perspective as well as from the MED perspective, are substantially higher then in more traditional areas of Euro-Med cooperation (cf. Barcelona Process, Union for the Mediterranean).

The impact and scope of innovation in the Mediterranean Region as a sustainable source for economic development are, despite all differences, generally closely related and similar to the challenges to the management and support of the innovation process within the European Union. Innovation and (technology) adaption are both complex processes and need similar strategic approaches: innovation in research and science, but also innovation in a more broader, more applied and also less technical context has to be mobilised in order to create durable value and to sustain qualified employment and knowledge incorporation e.g. in the production processes.

With a view to achieving these objectives, the main intervention strategy for strengthening innovation in the Mediterranean region needs to be based on the following pillars:

- i) Evidence-based identification of the common technological and socio-economic issues that the societies around the Mediterranean Basin are facing.
- ii) Join forces to be able to tackle shared problems in real time
- iii) Enhance cooperation between EU members and enhanced collective capacity to achieve the cooperation objectives;
- iii) Establish joint research priorities in a transparent, aligned structure and simplified procedures to access the financial support.
- iv) Active monitoring and detailed documentation of the performance and output.
- v) Develop routine feedback mechanisms for learning from experience.

Only a close cooperation and mutual awareness of complementary and substitutive actions at the national, regional and international level will increase the impact of the cooperation and the effective allocation of resources.

RECOMMENDED ACTIONS

Several specific actions and instruments have been jointly identified and recommended for further consideration:

- Setting realistic goals. Open and transparent communication about strategic goals, objectives and the scope of possible measures. This will be an important step to avoid unrealistic expectations and increase accountability of the cooperation.
- Concerted collection of relevant innovation and technology data at the firm-level and research institutions in order to enhance the new R&D&I policy design.
- Development and introduction of new, common indicators for measuring inside-frontier innovation and research activities at the micro-level to complement the standard science, and technology indicators.
- Consider a separate budget line within the Horizon 2020 framework dedicated to Euro-Med research and innovation cooperation. Special emphasis should be placed on new and emerging research opportunities that can enhance the development potential in the MED region in particular all areas that address social and economic challenges.
- Enhance cross-Mediterranean joint learning and training of students and faculty in the area of innovation and entrepreneurship; support university reforms and the revision of curricula.
- Establish new career paths through excellence in applied research. Establish career and start-up promoting policies for firms and researchers to interact at an early stage.
- Increased support for multilateral cooperation targeted at increasing quality and quantity of high-potential start-ups. A tighter cooperation among financing institutions and instruments will create a critical mass of excellence and will help to create a leverage effect.
- Clear and recurring launch of multi-regional EU tenders for early stage business and start-up activities and organized Euro-med venture capital fairs.⁶
- In addition, consider launch of an “open/unbiased competition” that does not define the sector, scope, or the research subject beforehand. Not endorsing champions a priori potentially increases creativity of applicants and the originality of projects as well as the relevance of the project.

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Parallel session 7: Changing Science in Changing Societies

Author: Jean-Eric Aubert, with the contribution of all the participants of the panel³

This note summarizes the main outcomes of the presentations and discussions of the session 7 of the conference, entitled “Changing Science in Changing Societies”. These outcomes are presented according to the instructions given by the organizers, and as expressed in the concluding session of the conference. They cover three questions, with three points in each of those:

- Major issues to focus on;
- Main challenges to be addressed;
- Priorities for action and next steps.

Major Issues to focus on

Putting science and research more in service of the economy and society

The principal concern, expressed more or less explicitly by the panellists, could be summarized as the need to put science and research much more in service of the society and the economy than it is presently the case. This concern is obvious in Mediterranean Partner Countries, where science and research lacks crucially of resources and means, and is poorly connected to the economy and society, as shown, among other things, by the very low contribution of the business sector to the R&D effort. There are significant scientific competences, notably in the higher education sector, but they have not much opportunities, time and resources to invest in research. There is also a huge potential in the scientific Diasporas. Meanwhile there are considerable expectations on the role that science and research can play to help satisfying the basic needs of the population, improving their daily life, creating new activities, etc. On the Northern rim, although the problems are much less acute, there is also a feeling that much should be done to make science contributing more and better to the development of the economies and the improvement of populations’ well-being, protecting the environment, etc.

Reducing the social and human sciences problem

A particular concern was expressed about social and human sciences. In some of the Mediterranean partner countries, up to 85 per cent of students choose SHS disciplines including art and humanities. While SHS are important to understand cultures, economies and societies, more effort should be put in general education to prepare the youth also to natural sciences and engineering studies and to help the youth to find a job afterwards. While the situation in the Northern rim is less problematic employment-wise, it was noted that SHS from Mediterranean countries do not contribute enough to facilitate a positive transformation of societies; more specifically, it was noted that the contribution of Euro-Med social scientists to the analysis of the Euro-Med area is still limited, as compared to inputs coming from other parts of Europe, North America and even Asia.

³ The Panel included: Jean-Eric Aubert (Center for Mediterranean Integration -- chair and rapporteur of the panel), Rym Ayadi (Center for European Policy Studies, Belgium), Andreu Bassols (European Institute of the Mediterranean, Barcelona), Sherif Fakhry (Science and Technology Development Fund, Egypt), Christian Hülschörster (German Academic Exchange Service), Marcelo Scalisi (Mediterranean Universities Union), and Fahoum Shalabi, Assistant Minister for Education, Occupied Palestinian Territory.

Dealing with a problematic political “climate” vis-à-vis science and research

Along with such negative perceptions, there is an overall “climate” that is not favourable to science and research. In the Northern rim, there are serious budget problems, and science and research is not a priority, while attention is focused on shorter term issues such as reenergizing the growth process, reducing the public debt, etc. In the Southern rim, it is the job creation imperative that captures the political attention in difficult transition contexts. Also the overall economic reform processes are complicated and do not facilitate the mobilisation of the scientific and innovative resources.

For summing up, one can say, to a certain extent, that there is a need to reintegrate science in the “culture” prevailing today in the Euro-Med area, i.e. in the overall mind and behavioural patterns of populations and politicians.

Main Challenges to be addressed

Those challenges, as discussed by the panellists, relate to science and research policies themselves, and concern their scope, their priorities and the procedures used by such policies.

Policy Scope

As regard the scope, the key point is to cover in a holistic manner the whole spectrum of education, research and innovation, as underlined in the presentation made by the EU Commissioner at the opening of the conference. The lack of integration between the institutions that deal with education, research and innovation do not facilitate such a holistic approach. Things are even more challenging because, when speaking about education, one should go as far as starting from basic education, since it is there that the interest and understanding of the youth for all areas of science and engineering studies are shaped. Even more, there is a need to go deeper, in the culture developed in the family itself, where values, critical capabilities, etc. are formed.

Policy Priorities

There is a general agreement that the science and research effort in the Euro-Med area should focus on common issues such as water, environment, marine resources, etc., and the boosting of competitiveness, job creation, and so on through innovation, particularly in the Mediterranean Partner Countries. This being said, there are numerous challenges regarding the resource allocation processes: What should be the scale of projects? Should policies focus on flagship projects with large impacts, or support less visible and more dispersed efforts in basic research for instance, although useful with a long-term perspective? How to produce tangible results, notably for the populations as a whole, who want to see science and research helping to solve their daily life problems? And last, but not least, even with a general agreement between Northern and Southern partners on broad priorities, if there is not a real feeling of ownership from the latter, thanks to true co-design processes, the implementation of projects will meet a lot of difficulties.

Policy Procedures

Concerns were, notably, expressed about the EU mechanisms. R&D support procedures, designed initially for more advanced research systems, have proved to be not well adapted to those in place in the MPC, that, for instance, need more consideration to relevance criteria than to excellence criteria in project selection. Also diverging viewpoints have been noticed between the various EU entities involved in decision-making processes and budget allocations (DG Research and Innovation, DG in charge of Cooperation and Development, External Services). Surprising administrative barriers also are found: for instance, decentralised cooperation between regions is not allowed when regions are not contiguous, making, for instance, impossible the cooperation between the Northern regions of France with a Maghreb country.

To sum up, the main challenges seem to relate to institutional silos, fights, barriers, and so on.

Priorities for Action and Next Steps

How to put more science and research in service of the economy and society, in a “climate” that is not at all favourable, and when there are a number of institutional difficulties to overcome? The panel has provided three types of complementary policy orientations – relatively straightforward and logical.

Provide as soon as possible a strategic framework and a significant budget to a renewed partnership

The first thing is to provide as soon as possible a clear visibility and offer a determined engagement for the renewed partnership between the European countries and the Southern Mediterranean countries. There is a need for a political will for that, and influencing networks and change agents should help building it. This engagement should include the provision of a significant budget envelop with broad priorities on topics of common interest. This framework should, of course, be commonly agreed with Mediterranean Partner Countries.

While providing general guidelines regarding the nature of projects and activities to be developed, this framework should facilitate a large expression of creative proposals through a bottom-up process, mobilizing a large span of actors at different levels. That would help articulating and nurturing a strategy with a solid content.

In doing so, it is important to seek for the involvement of the global community, beyond the European Union. While OECD countries, North America and Japan in particular, should be involved, it is important to attract other global players, notably the emerging giants, China and India. This implies giving a positive image of the Euro-Med area, showing its dynamism and creativity, and the huge challenges that it faces can be approached as positive opportunities.

Learn from good practices and adopt them

A second major recommendation made by the panel is to learn from the past experience and adopt systematically good practices developed over the years within the Euro-Med context – which constitute a “hidden treasure” to be better exploited. In this perspective, the German bilateral cooperation provided the following lessons:

- Always go with co-funding from both Northern and Southern partners, even if that concerns small sums from the latter;
- Always go with inclusion of young scientists as criteria when selecting and supporting projects;
- Pay attention to returning alumni, after they have benefited of stays in Europe for preparing their Ph.D. or the like, and for that purpose, provide start up grants to help them launching their activities in their country of origin;
- Make use of bilateral support, as a kind of seed money, to help preparing application and obtaining funding from larger EU projects;
- Train in the management and good governance of universities, research teams, projects, and programs.

Other important lessons derived from the EU experience include:

- The value of Regional projects or programs involving several partner countries, facilitating the building and use of critical mass of competences and stimulating cross fertilization among research teams;
- The importance of Multidisciplinary projects, notably when tackling environmental and societal issues, in which both hard and soft sciences need to be mobilized, as well as both science and engineering competences.

It was also recommended to proceed systematically with monitoring and evaluation practices in order to strengthen conditions of project implementation and measure related impacts.

Facilitate capacity building and empowerment of transformative networks and change agents

The third set of major recommendations concerns the need for a well-articulated approach of both capacity and power building. Both dimensions – capacity building and empowerment -- are key. While it is necessary to strengthen project and institutional management capabilities, it is also necessary to facilitate the building up of efficient transformative networks and coalitions of change.

These networks and coalitions, operating as bridge between the Southern and the Northern rims, include many different types of people, beyond the scientific communities. Particularly important are:

- The business sector, that needs to be involved as much as possible in project design and implementation, by means of matching funds and appropriate public/private partnership mechanisms;
- The civil society, and notably the NGOs, that should be able, notably, to convey societal and environmental expectations in project/program design and implementation;
- The students, for whom the ERASMUS program should be very significantly enlarged.

Maximise the impact of projects and programs

Finally regarding the impact of projects -- an issue discussed in plenary when the panel conclusions were presented --, the following points were made:

- Firstly, the impact of projects will be much dependant on the ownership felt by Southern partners in the co-designing of projects; this feeling determines the mental and institutional “energy” put in implementation processes;
- Secondly, of course, the adoption of good practices in project selection and implementation (see above) is crucial to ensure success;
- Thirdly, depending on the nature of projects, the scale of the effort is a key parameter; in basic science, moderately large, even small, but well-tuned, efforts geared towards well-selected teams might produce big results; in other circumstances, and notably for flagship projects that need to produce highly visible results, it is necessary to put a critical mass of efforts, and to insert the research work within a broader development framework (e.g. including public procurement and investment);
- Finally it is obvious that project impacts need to be assessed according to proper criteria. It is inappropriate to expect direct job creations from a number of R&D activities, in a short, and even medium, term perspective. But it is essential to assess them on the quality of scientific findings or articles being produced, the technical prototypes being developed, the networks being built, etc.

Parallel session 8: Coordination of research and innovation programmes and funding instruments

Main authors: Rafael Rodriguez Clemente and Abdelhamid El-Zoheiry with the contribution of all the participants of the panel

I. THE POLITICAL LANDSCAPE

The EU policy toward the Mediterranean Countries took a definitive profile and priority in the Barcelona Process launched in 1995, where the Members States and the Mediterranean Partners Countries (MPC) expressed their shared wish of a Mediterranean space of security, economic development and socio-cultural exchanges, implemented through Association Agreements (AA) between the EU and the MPC. This was followed by the setting of new policy instruments, such as the European Neighbourhood Policy (ENP) in 2003, developed through its Financial Instruments (ENPI). More recently the Union for the Mediterranean (UfM), launched in the summer 2008, with the intention of rebuilding the EU-MPC partnership on the basis of a Co-Presidency EU-MPC.

The Barcelona declaration, the ENP Action Plans and the Association Agreements, together with the new Union for the Mediterranean, constitute the frame of the cooperation between the EU and the MPC, and they are the reference point for the cooperation policy development executed by different General Directorates of the European Commission. The EUROPE 2020 strategy (1) also mentions as a key issue the cooperation with neighborhood countries on societal challenges, and the European will to better help their own reform efforts. It is worth mentioning that a recent Report of an EC Expert Group, EuroMed 2030 (2), also points out to science and innovation as a critical resource to address social and political challenges as well as the needs of industry and the transformation of the production methods, even if the perception of research as a need is not yet fully perceived by the industry in the MPC.

The Euro-Mediterranean Ministerial Conference on Higher Education and Research held in Cairo in June 2007 (3), stressed the need to move toward the creation of an Euro-Mediterranean Research and Innovation Area, by promoting:

- Modernizing the R&D policies in the MPC
- Supporting institutional Capacity Building
- Enhancing the participation of the MPC in the FP, while taking into account their particular needs and the mutual interest and benefit.
- Promoting Innovation in the MPC by enhancing exploitation of the RTD outputs by society and Industry
- Favouring mobility of researchers.

The recent revolutions in the south Mediterranean have driven the region in the throes of major political, economic and societal transformations, the effects of which will extend beyond the Mediterranean region. Education and research policies, sustainable development, democracy and citizens' empowerment and viable economic, industrial and employment models, among others, are emerging as fundamental areas of transformation in the region. **Rethinking the EU-MPC cooperation agenda is a necessity to address such dynamic transformations.**

In May 2011, addressing the ongoing transformation in the Mediterranean, the EU issued a Joint Communication "*A new response to a changing Neighbourhood*" (4) stressing the need for a new approach to strengthen the partnership between the EU and the ENP countries. Working towards the development of a "common knowledge and innovation space" is underlined as a cooperation priority. **The EU member states and MPCs share the responsibility and commitment of putting these words into action.**

The aspirations of the MPCs were also highlighted in the 15th meeting of the Euro-Mediterranean Monitoring Committee for RTD (MoCo) in June 2011 in Szeged, Hungary, where the principles of demand-driven and impact-driven EU-MPC cooperation based on co-ownership and co-funding were outlined.

II. STATE OF PLAY

- **EU-MPC Science Technology and Innovation (STI) Framework**

The perception of citizens regarding the benefits of scientific research, its universal character, and its detachment from ideological models that cause conflicts between countries and religious communities enable cooperation models in this field to be seen as an experimental platform that issues recommendations on cooperation mechanisms contained in the Barcelona Declaration. Moreover, the cosmopolitan, international nature of scientific relations turns them into a model based on mutual respect and recognition of the abilities of the collaborating parties, becoming a reference for other areas of cooperation defined in the Barcelona Declaration. However, scientific activity cannot be undertaken independently of each society's cultural models and specific circumstances, particularly in terms of their public administrations. The development of Euro-Mediterranean scientific cooperation suffers from a shortage of appropriate infrastructures to channel its activities. Nevertheless, a number of cooperation networks have been created through programmes that are either bilateral (state-to-state) or multilateral (framework programme or major regional programmes), yielding significant achievements on which to build projects of mutual interest and Euro-Mediterranean integration plans (the ERA European Research Area, and EMRIS Euro-Mediterranean Research and Innovation Space). Certain research fields offer real collaboration opportunities based on mutual interest, and a large part of the scientific community in MPCs has forged and maintains strong ties with universities and research centers in the EU. Indeed, many elements suggest that this type of collaboration can be successfully set up.

Scientific cooperation between the EU and MPCs with community funding has had its own identity since 1992 with the INCO programme, which was created during the 3rd Framework Programme (FP) and continued through successive FPs. So far, some 500 million Euros have been spent on over 600 joint projects in areas dealing with issues of common interest, from healthcare to the development of Information and Communication Technology (ICT).

The Monitoring Committee of Euro- Mediterranean Cooperation in RTD (MoCo) created after the Barcelona declaration in 1995, and formed by senior officials from the 27 EU Member States and ten Mediterranean countries that form the Euro-Mediterranean association (Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Syria, Tunisia, Palestine and Turkey) has identified the most relevant challenges and proposed actions to stimulate the EU-MPC S&T cooperation. 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 of synergies, as there is a generalized view that the tools and resources available to scientific cooperation policies do not yield the expected results.

The **EURO-MEDITERRANEAN CHARTER FOR ENTERPRISE** (5) targeted the objective of making the Euro-Mediterranean region a vast area of free trade and economic prosperity, with strong development perspectives for entrepreneurs in order to play the globalization card and make the most of the opportunities offered by the opening up of the Euro-Mediterranean economic area in 2010. The questions of how to remain competitive and create a sufficient number of jobs for newcomers on the labor market, and to define strategies to create value and achieve complementary economic development are central to the research and innovation chain.

- **Overview of relevant programmes/projects/actions**

The fields of cooperation targeting research, development and innovation, are covered by numerous instruments among which we can highlight:

- The **7th Framework Program**, managed by DGs RTD and INFOSOC, is open to participation to partners from all the MPC in most of its actions, with special targeted Call for Proposal addressing “Specific International Cooperation Actions” (SICA) covering topic of mutual interest EU-MPC. There is not a specific budget for this activity, as it is described in each specific yearly Work Program of the Thematic Priorities. Other actions such as International Cooperation of “Marie Curie” grants are also open for MPC participation.
- The **Euro-Mediterranean Industrial Cooperation Program**, managed by DG Enterprise in consultation with the Working Party on Euro-Mediterranean Industrial Cooperation, is an instrument created in the Barcelona Process and it is financed by the provisions of the Bilateral Association Agreements and the ENPI
- The **Competiveness and Innovation Framework Program (CIP)** is open to the participation of MPC through the Entrepreneurship and Innovation Programme (EIP)
- The **EUREKA** Intergovernmental Program is also open to MPC.
- The **ENPI Regional Indicative Programme for Euro-Mediterranean Partnership** is the most important instrument for regional cooperation. It is supported by a scheduled total funding of 343,3 ME for the period 2007-2010, following the priorities defined in the Barcelona Process, later redefined in the UfM in the Marseilles summit of November 2008. Here, again, RTD is a high priority in several actions, notably the Mediterranean Strategy for Sustainable Development, including the Horizon 2020 Project aimed at decontaminating the Mediterranean Sea, the integration of the energy, transport, ICT and research markets. The funding earmarked for the activities of sustainable development for the year 2009 is 69 M€, and for 2010 is 47 M€. This Programme is the most important financial instrument for the EU-MPC regional cooperation. The development of this ENPI through the RDI programs is providing a substantial input to the capacity building in several MPC.
- **ENPI Cross-Border Cooperation** Based on earlier experiences under Tacis, Meda, Phare and Interreg, a new policy “Cross-border cooperation (CBC)” on the external borders of the EU is a key priority both in the European Neighborhood Policy (covering the countries of Eastern Europe, the Southern Caucasus, and the Southern Mediterranean) and in the EU’s Strategic Partnership with Russia. It likewise figures in associated policies such as the Euro- Mediterranean Partnership (Barcelona Process), and the Northern Dimension. The adoption of the European Neighborhood and Partnership Instrument (ENPI) has considerably enhanced the scope for cross-border cooperation, both qualitatively and quantitatively. The core policy objectives of CBC on the external borders of the Union are to support sustainable development along both sides of the EU’s external borders, to help ameliorate differences in living standards across these borders, and to address the challenges and opportunities following on EU enlargement or otherwise arising from the proximity between regions across our land and sea borders. Two main categories of programmes will be established under ENPI-CBC: programmes covering a common land border or short sea crossing, and programmes covering a sea basin (notably the Baltic and the Mediterranean). The programmes are principally defined based on the eligibility as defined in the ENPI regulation, while taking account also of the need to maintain continuity from previous programming periods, and facilitation of programme management. The Sea-Basin Mediterranean program will be financed with 90,539 M€ for the period 2007-2010, 83,068 M€ for the period 2010-2013, a total of 173,607 M€ for the period 2007-2013.

- The Facility for **Euro-Mediterranean Investment and Partnership (FEMIP)** was created in 2002 and provides funding for private sector development in the Mediterranean region aimed at sustainable economic growth. Tentatively, a capital of about 32 M€/year is allocated to FEMIP for technical assistance and risk capital. However, in the 2005 summit of Barcelona, a Neighbourhood Investment Fund, built on the FEMIP, was scheduled 700 M€ (roughly 100 M€/year) to be used to lend to the ENP, including the MPC, and acting as a leverage to multiply the financial engagement by other actors, notably the MS.
 - In the field of **ICT**, the **EUROMEDCONNET** Project, financed by the late program EUMEDIS of the MEDA Program, was aimed at connecting the scientific networks of the MPC with those of the EU members states. In the coming years, emphasis will be put in developing networks of **e-learning**, **e-health** and **e-culture** using the ENPI facilities at the bilateral and regional priorities.
 - **Technical Assistance and Information Exchange (TAIEX). Programme** (<http://taieux.ec.europa.eu>) TAIEX provides short-term technical assistance and advice on convergence with EU legislation, best practices and standards and on related administrative capacity needs, technical training and peer assistance, as well as a data base and information network that facilitates the monitoring of approximation measures. MPC partner countries have taken up this demand-driven instrument, which is key in supporting the transition and reform processes.
 - **Twinning Instrument** (http://ec.europa.eu/europeaid/index_en.htm). In recent years, the **twinning** instrument was expanded to benefit ENP partner countries. Twinning allows the EC to agree with a partner country on the placement of an experienced EU Member State official (long-term expert) into a ministry or public institution of an ENP partner country, to support legislative reform or administrative adjustments through the transfer of experience gained within the EC. A good example of this action is the Twinning Project to support the incorporation of Morocco into the The Commission can draw on a wide range of twinning experts through the network it has established with EU Member States. Again, after an introductory phase, partner countries increasingly made use of this instrument. By end 2007, 65 twinning covenants had been established with nine ENP partner countries, whilst 81 covenants were still being prepared and under negotiation with ten ENP partner countries. These 146 twinning projects are well spread between ENP partner countries and across a wide range of sector policies (see Annex). The introduction of the ENPI instrument also saw the extension of **sectoral budgetary support** to all ENP partners.
- **Gaps still to be addressed and problems to be solved**

The main obstacle for a structured scientific cooperation lies in the **lack of “symmetry” between the cooperating systems**. By “symmetrical systems” we understand a set of management procedures of both systems that are known and accepted by each other. The cooperation system is complex, and includes, besides the scientific recognition and common interests, which are basic requirements, recognition of the administrative procedures. The main consequence of the lack of good connectivity between the cooperating systems is the subordination of the scientific cooperation to the pace of the slowest process that affects it. This lack of swiftness in the practical launching of cooperation actions results in loss of “freshness” and motivation of the partners. More must be done to improve the process of cooperation in its multiple dimensions: scientific, administrative and financial.

The Work Programme of the Barcelona Process approved in the Euro-Med Summit of 2005 for the period 2005-2010, identifies 8 thematic priorities for cooperation, including environment, the Millennium Development Goals, South-South regional integration and several other social and political objectives, including mitigating the illegal immigration. Some of these priorities are implemented by means of Calls for Tenders such as the EuroMeSCo Network responsible to gather the competences of foreign policy institutes and produce report on relevant policy issues of the EU-MPC cooperation process. Other similar networks are supported by the ENPI, such as FEMISE (network of Economic Sciences Institutes). **No such network**

of Research Institutes has been created in the fields of scientific research and governance support, in spite of the formal engagement of ENPI to support the participation of the MPC in the 7th FP.

The **heavy and cumbersome administration of the European Research Funds** suffered by the European participants is almost unbearable by the Mediterranean participants. We are witnessing in the last years progressive retreat of excellent scientists from the MPC from the Framework Programme due to their incapability to handle the administrative aspects of participating in a project, as they have very little technical and administrative support from their administrations, even if this aspect is slowly progressing, and the enormous amount of effort and time that implies the reporting and attentions to audit and other activities nor related to the strict scientific activity.

Can this situation change? Certainly. In fact the main problem faced by the scientific community is its dependence on administrative frames that operate by the principle of close control of expenses related to the project and multiplying the financial and personnel engagement in reporting and audits and other activities based on this principle, while the scientific content and results of the activities and its impact are not situated as the main issue of the projects.

So what to do? There are no easy solutions, but the problems are there and they represent a big hurdle to stimulate or support the necessary EU-MPC cooperation in research and innovation. More capacity building of administrators in the MPC is needed and the EU Financial Rules must take into account the specific characteristics of the international cooperation. The “Third Parties” concept, i.e., support structures or companies for the handling of the funding received by MPC partners, must be developed and stimulated, in order to leave in professional’s hands the managerial tasks of accounting, reporting and providing services to the MPC participants in the cooperation projects. At this moment there is a wide perception that the opportunities to the MPC offered by the European Programs for S&T cooperation are much more difficult to handle than the Chinese, American, Brazilian or Russian programs, and there is a net transfer of partnering from the traditional European partners to those coming from other countries.

The identification of common priorities in regional cooperation must start with the analysis of the national research programs of the different countries, and the finding of the common areas of interest and their similarity with European priorities. Only by this mean can the sustainability and long term maintenance of research program be guaranteed.

The **obstacles to mobility** represent an important hurdle for cooperation. We cannot talk of a Euro-Mediterranean Research and Innovation Space, with the actual system of Visa delivery to the scientific partners from the MPC. The real implementation of the Scientist VISA Directive is a must. It is simply unacceptable that scientists participating in cooperation projects that must travel often to Europe, request each time within a single year several visas, and suffering the times delays and bureaucratic barriers. These asymmetries in the cooperation, together with the inappropriate indemnities for travel to Europe for the MPC participants, further add to the hurdles of this cooperation.

Another important factor, particularly emerging with the recent changes in governance in the Mediterranean, is that international cooperation with southern Mediterranean countries should be **impact-driven and demand-driven**. The fact that the results of this cooperation should be addressed to and perceived by the MPC’s societies should not be overlooked. It should be noted that it is the people and not the rulers, like before, who are currently driving the political and socio-economic agendas in the MPCs.

III. PROPOSED TOPICS TO BE COVERED

1. Optimizing the use of programmes and funding instruments covering Research and Innovation chain

An important issue is how problems and challenges of the industry, usually SMEs in the MPC, or even, the acquisition of emerging new knowledge by these companies can be addressed by the research system. This is a fundamental question because, typically, the intellectual interest of the Higher Education and the Research organizations should be directed toward identified global challenges to be studied by the scientific community. The point here is how common interest between the industrial sector and the scientific community can be created. There are two key issues; the conceptual and language barriers between the two sectors and the shared benefits for both of them. The first issue must be addressed by considering the chain of stakeholders in the knowledge transfer process; technical sectorial laboratories are very useful in interpreting the needs of the industry, particularly the SMEs, in terms understandable by the scientific community; even the translation of knowledge into practical industrial procedures is better done by engineers than by scientists. The other point is that the expected benefits that an innovative action can bring to the final beneficiary, the industry, must be shared by the intellectual supporting frame, such as Universities and research Institutes and the positive results of this interaction must be included in the inception of the “curricula” of the Academy. Many times the interesting product is not just a patent, difficult to produce and defend in the competitive international arena, but also the “know-how” and the dependence of the business sector on a reliable local scientific support system in its own environment. The setting of this cooperative frame and the building of trust between the actors are fundamental steps in the creation of a national innovation system.

The commitment of the scientific community to the goals of research application for economic and social development is a major concern. In the absence of a real demand from the national authorities to tackle social or economic concerns, or demands from the business sector, research is self-organized around global challenges and priorities produced and monitored by the international research community through their organizations, congresses or journals; scientists work to obtain international recognition within this context, and this is a major incentive to keep this state of affairs in the absence of other stimuli.

If the socio-economic development plan of a country demands efforts from the scientific community, the framework for its engagement needs clarity on a number of issues:

- Rethinking of the laws and regulations that recognize academic excellence and govern promotion of university and research centers faculty members. Advancing academic careers should not be based solely on publications; i.e the criteria of evaluating academic excellence should be expanded to include the valorization of research results.
- Developing and offering comprehensive incentives schemes to link the Academia and the Industry and engage them in productive cooperation.
- Legitimize sharing of the benefits derived from the exploitation of knowledge by the research community whether institutionally, at the level of universities and research centers, or individually, at the level of the knowledge authors. Similarly, a support system to facilitate the creation of start-ups by the academic community is needed.
- Devising programs to facilitate the incorporation of academics and scientists in the industrial productive system, as a way to facilitate the appropriation of knowledge by the industry, along the lines of the “Faculty for Factory” Program launched in both Jordan and Egypt.

- Allowing the industry access to the knowledge relevant to its activity sector, at national and international level, to be able to detect challenges affecting their activity, such as the regulations evolutions. The industry should also benefit from the scientific infrastructures for their own control or monitoring needs.

2. Coordination and synergies between bilateral/regional programmes

The Strategy EUROPE 2020 (1) clearly states the need of streamlining the different EU instrument to tackle the Societal Challenges that Europe is facing. This philosophy also applies to the International Cooperation dimension. A number of actions are underway to support the EU-MPC scientific cooperation, notably the full participation of the MPC in the European S&T Framework Programme, including the MPC participation in at least two ERA-Net initiatives such as Forest Research in the Mediterranean Region (FP7-ERANET-2011-RTD/KBBE) and Coordination of Agricultural Research in the Mediterranean Area (ARIMNET, FP7-ERANET-2007-RTD/KBBE). However, more work and shared commitment for mutual benefits between the funding agencies of the EU and the MPC must be promoted.

The development of the Bilateral Association Agreements between the EU and Morocco, Tunisia, Egypt, Jordan (6)(7)(8)(9) and Algeria to specific agreements on Science and Technology cooperation has provided the legal and political frame to discuss the common interest at a bilateral level between the EU and the MPC. Since then, different bilateral programmes have been developed and implemented, from which lessons have to be learnt in terms of coordination and synergies.

The important Research Development and Innovation (RDI) Programs, financed by DG DEVCO have been launched in Egypt and Tunisia (10)(11) and Jordan. The RDI programme aims at linking the academic and industrial communities to embark on a fruitful cooperation, translating the research results into innovation by the industry.

Under the FP7 Capacities programme, DG-RTD is funding several bilateral projects (BILAT) for MPC to support policy dialogue in the frame of the S&T bilateral agreements on the basis of a bottom up approach. With the INCO-Net MIRA, synergies and coordination have been facilitated between these bilateral platforms and similar objectives and difficulties have been identified at a bi-regional level so as to be able to speak “one voice”. Also under the FP7 Capacities programme, another type of project (ERA-WIDE) directed to the MPC was launched aiming, among others, to build the capacities of the research institutes to develop their competitive strategies based on their comparative advantage/disadvantage in the region.

Certainly, the two approaches; regional (FP7 funded by DG-RTD) and bilateral (RDI funded by DG-DEVCO) must coordinate their actions. But more important is the coordination and synergy between the RDI programmes themselves. Much could be done in this sense including initiating a certain “smart” specialization of the capacity building at national level that could aim at establishing a regional leadership in the Mediterranean open to the participation of all the countries. Synergizing the RDI programmes could address this challenge.

It is worth mentioning that in the case of RDI-Egypt, cooperation and synergies were established with INCO-Net MIRA (FP7 INCO-Net project for the Mediterranean) and in the Tunisian RDI program, the proposed actions are in line with the thematic regional recommendations of cooperation defined by MIRA (12). However, both programmes are yet to establish bilateral coordination and synergies.

Similarly, valuable lessons and best practices could, and should be, drawn from coordination and synergies between the ongoing BILAT and ERA-Wide projects, where research institutes of the MPC have the mandate to act as coordinators.

Clustering the BILAT and ERA-WIDE projects would provide a valuable experience-sharing platform for the MPCs to build their Research and Innovation value chain strategies and competitiveness, as well as the EU to draw lessons on best practices in cooperation with their southern neighbours.

The EU Member States bilateral agreements of S&T cooperation with the MPCs represent other important actors that should coordinate their objectives with the global perspective of an EU action in the Area. The SFIC recommendation of strengthening the networking and cooperation among the EU and Member States Science Counselors in the MPC should be implemented in a systematic way (13). All the current European structures and initiatives should find a common place to interact and generate synergies and higher value of the resulting outputs. Similarly, **the MPCs should establish their own coordination mechanism/platform to develop a common perspective towards the EU. This ensures a sustainable and balanced approach based on a common vision and shared responsibility.**

3. Toward a regional Programme for Research and Innovation

The previous description of the state of play indicate that many actions are been done pointing to the same direction but ruled by different instruments, mechanism and decision making fora. This situation demands a regional programme for science, technology and innovation where the different components could find a place in a global strategy. The new landscape in the southern Mediterranean offers an unique possibility to unlock the potentials of research being a leading instrument for development in a democratic environment.

The EU's recent "Innovation Union" flagship (14) emphasizes the importance of innovation in tackling contemporary societal challenges. Innovation is essential for the transition of economies towards resource efficient and competitive knowledge-based societies that ensure sustainable and inclusive growth and jobs. The Council's conclusions underline the need to stimulate the culture of creativity, science and entrepreneurship, particularly among young people. It also recognizes the multidisciplinary nature of innovation and the potential of social and public-sector innovation to improve services and engage a wider and more inclusive community. The MPCs, with their recently empowered populations demanding to explore their potential, aspire to share this vision of a common innovation space with the EU. However, for this vision to thrive, it should be constructed on the basis of mutual interest and shared benefit.

Building on the successful experience of the EU bilateral RDI programme, a dedicated regional initiative to develop the collective capacity of MPC's R&D and Industrial sectors to address their socioeconomic challenges, while being aligned with the EU's strategic cooperation areas of interest would significantly contribute to the achievement of this shared vision. Such an initiative can play an important role in addressing the demands of the MPC's young populations for vibrant democratic societies that work towards high levels of employment and improved well being, while contributing to achieving the EU's Innovation Union Initiative.

The different components of this programme should be geared towards a global EU-MPC strategy. The key element of such strategy must be the common interest, the co-ownership, and the setting of appropriate legal and administrative instruments within a favourable social and economic environment. The areas of common interest have been well established by the common challenges emerging in the last years. These include the scarcity of natural resources, namely water and energy, climate change, the demographic evolution and the demolition of a fragile shared environment, among others (12).

The overall objective of the regional Programme is to support the MPCs STI policy formulation and their RDI performance, facilitating their advancement towards a knowledge-based economy. This could be implemented through a cooperative scheme for granting innovative, economically feasible, demand-driven projects bridging the gap between applied research and real regional industrial and economic development needs. Another component would provide TA for restructuring STI governance and formulating policies, which, together with funding cooperative innovation projects, would act as a catalyst to boost the EU-MPC STI eco-system.

The experience of scientific and business cooperation and the evolution of the economic systems along these years (15) also provide arguments for the need of a deep analysis of the actual frame of relations, and the search of a new one based on a clear perception of where the benefits are and where are the political, social and administrative hurdles that create dis-functionalities and impede benefiting from the opportunities offered by the proximity and cultural similarities on both sides of the Mediterranean.

IV. Definition of the main elements for a medium to long terms agenda of Euro-Mediterranean Cooperation in Research and Innovation

The experience of the last 20 years clearly shows that the Agenda defined in Barcelona in 1995, for the Euro-Mediterranean partnership, cannot be attained due to political and social constrains. On the contrary, the scientific cooperation, being driven by curiosity and sharing a common language and long terms interests, has always been maintained, even between hostile countries, and has considerably improve along these years reaching an stage where further developments are blocked mainly by procedural obstacles.

- **Specific objectives in relation to the topics**

Most of the surveys dealing with improvements of the Euro-Med S&T cooperation activities acknowledge the blocking effects of the administrative and financial management barriers to make the most of the many bilateral and multilateral programs aimed at supporting the EU-MPC S&T cooperation. On the other hand, the new perspectives in the European Neighborhood Policy and the upcoming EU Framework Programme Horizon 2020 make emphasis on the co-ownership of the International Cooperation actions and the target of mutual benefits of these actions.

In this context, the specific objective of this session is to explore the possible framework conditions, mechanisms and instruments to facilitate the S&T cooperation, taking into account full acknowledgment of the mutual benefits, co-ownership and co-responsibility of all the participating parties. The issue is not that simple, because mechanisms that respect national legislation of cooperation in both the MPC and the EU and the handling of financial resources are not easy to harmonize and agree. Therefore, it is important to explore possible solutions in the frame of international agreements, or legal solutions that do not contradict the national procedures in the participating countries. Also important is to readdress this cooperation with innovative instruments that would augment its impact and widely engage the communities of the partnering countries to ensure sustainability of the cooperation.

- **Main interventions strategy: including national, regional perspectives and the role of international cooperation activities:**

Among other recommendations, it is acknowledged that the transition towards a knowledge-based economy in Mediterranean Partner Countries (MPC) requires at least:

- Economic and institutional frameworks capable of promoting swift management of the resources used for research and the efficient use of knowledge and innovative forms of entrepreneurship, in line with the recommendations of the Euro-Mediterranean Charter for Enterprise.
- Education of the population to create share and use knowledge, with special emphasis on professional training and promoting Doctorate Programs at the Higher Education levels in high quality research centers and in alliance with the demands of the industrial sectors.
- Investment in dynamic information infrastructures and systems for the industrial and research systems.

- Setting up national research and innovation programs to generate synergies with the industrial sector, research centers and, in general, the socioeconomic apparatus in MPCs.
- Developing regional demand-driven innovation and entrepreneurship programmes that would engage the growing population of youth in the MPCs.

All these actions must be incorporated in common EU-MPC strategies, merging actions of the European Neighborhood Policy, the national innovation actions plans and other political instruments aimed at using knowledge as an element of economic development. **Actions to be taken in this line** will be, among others:

- Link the International S&T Cooperation Programs to targeted objectives of the national Innovation strategies and associating, if possible, the business sector to these Programs.
- Facilitating the mobility of business and research people to places, companies or research institutions, where good practices of technological transfer or knowledge are used.
- Capacity building in making the interface of Research and Innovation systems, which, in general, have only random contacts as they fit different demands and expectations. The creation of mutual acknowledgement and trust between the actors of these two systems is a prerequisite to make the most of the efforts in knowledge exploitation in the MPCs.
- Specific actions and instruments: including range of actions and instruments necessary to achieve the objectives e.g. training, technology transfer, capacity building, support to reforms, investment opportunities for business, etc.

EU common actions are subject to the legal imperatives shared by all the member States (MS), which is a necessary condition to fully exploit the EU financial instruments. However, the necessary condition for EU-MPC cooperation, aimed at mutual benefits, co-ownership and mutual financial responsibility, is the common acknowledgement of legal and management mechanisms and shared appropriation of the defined structure and its functioning. **The key point is to identify a legal structure where the identification of common priorities and the funding mechanisms can find a practical expression independent of the national frames, but respecting the national legislation in international cooperation mechanisms, the expenses control and auditing requirements.** On the other hand, the implementation mechanism of the decisions of such cooperation frame must be also independent but professional in order to guarantee sound expectations of the handling of the cooperatives projects, propose ex-ante and ex-post evaluation mechanisms under international standards, mechanism of knowledge exploitation and a fair share of the exploitation results.

Some **legal frames** that fit these requirements could be explored:

- Use of the Article 185 of the Treaty (16), where some member states can decide to implement an action not shared by the rest of the members. This kind of actions could obtain limited support from the EC and can be governed by the agreements between participating countries. These actions are open to international partnership, and could be one of the possible instruments to be used.
- Creation of a European Grouping of Territorial Cooperation (EGTC) (17), which are legal entities able to implement Territorial Cooperation Programmes under the Structural Funds and other European programmes, and it also allows the inclusion of entities from Third Countries, if the legislation of the third country or agreements between Member States and third countries so allow.
- Creation of a Foundation under the most appropriate national laws where all the participating entities and countries, EU and MPC, could engage in an egalitarian and co-responsible step.

- Creation of a Macro-region (18). There is no standard definition for macro-region; the term has been used to describe both globally significant groups of nations (the EU, ASEAN etc.). The definition applied here, developed during the preparation of the European Union Strategy for the Baltic Sea Region, where Russia, Norway and Iceland participate, is “an area including territory from a number of different countries or regions associated with one or more common features or challenges.”

The existence of the structures described above, under the appropriate form, could be the bridging element to provide managerial skills and support for scientific cooperation actions, including research and innovation elements, as well as coordinating capacity building actions, knowledge transfer and promoting better interactions between the business and research systems, which at this moment lack the appropriate forum in a Mediterranean wide perspective.

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Parallel session 9: Building competence for Research and Innovation: governance, human capital and research infrastructure

Main author: Jejel Ezzine, with contribution of the participants of the panel

1) Introduction:

The simultaneous and historic unfolding of the Arab Spring across the southern rim of the Mediterranean sea and the acute economic crisis on its northern shores, prompted the Euro-Mediterranean community, under the leadership of the EC, to take stock of their collaboration, learn from their experience and renew their cooperation for a mutually beneficial partnership.

The Euro-Mediterranean Conference on Research and Innovation is the venue chosen to initiate this new venture and collectively conceive its agenda. In fact, Session 9, for which this concept paper is written, is meant to dwell on the important issues of research and innovation and was originally titled “Building competence for Research and Innovation: Governance, human capital and research infrastructure.” This session, along with its companion concept paper, are to address the following three issues:

1. *Enhancing Research and Innovation policies in the Mediterranean region (S&T Governance, institutional reforms...)*
2. *Human resources, training and mobility including Diaspora*
3. *Research and innovation infrastructures*

2) State of play:

“I want Europe to emerge stronger from the economic and financial crisis.” Declared José M. Barroso in the preface of Europe 2020 [1].

He added “It’s about more jobs and better lives ... The capability to deliver smart, sustainable and inclusive growth, to find the path to create new jobs and to offer a sense of direction to our societies.”

He further recalled “The commission is proposing five measurable EU targets for 2020 that will steer the process and be translated into national targets: for employment; for research and innovation; for climate change and energy; for education; and for combating poverty.”

Almost concurrently, the leaderless, and ideologiless, Arab Spring, sprang from Tunisia, spreading quickly to the neighbouring countries and beyond inspiring, *entre autres*, “Occupy Wall Street” [2] and echoing the same universal claims of freedom and dignity and demanding further political participation, and inclusive sustainable growth capable of providing jobs, and better lives.

These simultaneous unfolding events of the Arab Spring across the southern shores of *mare nostrum*, and the unprecedented crisis on its northern ones, behoves *mare mater nostra*, as affectionately called by some [5], and its siblings to rise to the challenge of this wake up call, and reconquer its centrality in this globalized world as the cradle of our future.

This common pressing and historic context that comes to exacerbate the already recognized global challenges, such as climate change, energy and water shortages, infectious diseases and food security to name a few, calls on the EU and the Southern Mediterranean countries, to jointly set ambitious goals for the Euro-Mediterranean region, and commit to synergistically respond to the aspiration of their present and future generations, through a new partnership paradigm, that goes beyond conventional cooperation.

As a matter of fact, the advanced Euro-Mediterranean cooperation in the field of energy is most telling in this regard. Indeed, the two sides of the Mediterranean are highly dependent on each other when it comes to energy supply, and they will be more so during the gradual implementation of the Mediterranean Solar Plan (MSP) by the Union for the Mediterranean (UfM) as a strategic macro-regional renewable energy programme under the Barcelona Process [9].

The implementation of this trans-national project will require the full engagement of the UfM member countries, the European Commission (EC), universities and research institutions, interested NGOs in the Mediterranean space, as well as public and private financial institutions, and the requisite difficult negotiations, and complex coordination crowned with the fitting diplomacy.

The regional and the planetary importance of this undertaking, due regards its guaranteed environmental benefits, sizable economic impacts, multiple technological opportunities, and unprecedented social benefits are well acknowledged. However, recognizing the required collective efforts to efficiently implement, and swiftly bring to effective production the different components of the MSP, **behoves** us to boldly rethink and thus restructure our cooperation programs, and usher a collectively beneficial partnership paradigm capable of realizing the aspirations of our people, and securing a peaceful and prosperous common Euro-Mediterranean destiny.

“If we act together, then we can fight back and come out of the crisis stronger. We have the tools and the new ambition. Now we need to make it happen.” Concluded Barroso.

2.1. Policy Framework:

The Euro-Mediterranean partnership, or the so called **Barcelona Process**, was inaugurated in November 1995, and established a wide spectrum of political, economic and social cooperation between the EU's Member States (MS) and the Mediterranean Partner Countries (MPC).

The Barcelona Process provided the two partners with a unique and ambitious framework where they could endeavour together towards a Mediterranean space of security, economic development and socio-cultural exchanges. This partnership was implemented through Association Agreements (AA) between the EU and the MPC, and a dedicated assistance programme (MEDA) [3].

Several evaluations of this partnership agree that “the Barcelona Process has missed its main objective: to respond to the hope of reinforcing the Euro-Arab dialogue and overcoming the differences between north and south of the basin ... As a bureaucratic process it has not been a platform for projects and dreams. The initial ambition has slowly faded away.” [4]

While most of the authors agree on the relative failure of the Barcelona Process, they don't concur on the nature of the underlying causes. In fact, three distinct factors were proposed to explain the obvious outcome: (i) financial, (ii) managerial and (iii) commercial.

The financial argument claims that not only the allocated budget was below expectation, but a very low percentage of it, e.g. less than 30% for MEDA I, was actually executed. In addition, only one project targeting innovation (EUMEDIS) was funded for about 1% of the total budget [3].

The managerial hindrances expressed itself on both sides. Underdeveloped administrative and bureaucratic capacities on the MPC side, due regards the European cooperation requirements, and a frail acculturation from the EU side [3].

The commercial dimension, i.e., the Free Trade Area, occulted the fundamental premise of the construction of the Euro-Mediterranean project, by denying to the Mediterranean space its geo-political, geo-economical and euro-strategic dimensions [5].

The enlargement of the EU and the ramping globalization, along with the above diagnosis, prompted the emergence of the **European Neighbourhood Policy** (ENP) since 2003, along with its European Neighbourhood and Partnership Instrument (ENPI). This new policy framework constituted a marked quantitative and qualitative step in the North-South Mediterranean cooperation, but fell short from incarnating the above mentioned strategic dimension [5].

The summer of 2008 saw the Barcelona Process evolve into the **Union for the Mediterranean** (UfM). This initiative aims at providing both shores of the Mediterranean with a framework, a strategy and means of action, allowing them to apprehend hand-in-hand the common challenges of globalization [5].

The unfolding of the Arab Spring impelled the EU to recognize the importance of this historic event and acknowledge its lasting and profound transformational consequences for the Euro-Mediterranean people, the world and the EU in particular [6,7]. **A new response to a changing neighbourhood** [7] and its companion communication [6], open the possibilities towards a prospective project of a Euro-Mediterranean **New Deal** [5], whose objectives, *modus operandi* and road map are advocated by the Euro-Mediterranean community.

2.2. Institutional Framework:

The Monitoring Committee (MoCo) was set up by the EC in the framework of the Barcelona Process, to promote the development of a Euro-Mediterranean space for Science and Technology by stimulating and monitoring RTD cooperation. To achieve this goal, MoCo proposes, among others, action plans to extend the European Research Area (ERA) to the whole region. It is composed of high-level officials representing RTD Ministers from MS and MPC. It is co-chaired by a representative of the country holding the presidency of the EU and a co-chair from the Southern shores.

Since 2001, and during its 8th meeting in Stockholm, MoCo focused its activities on two goals [3]: (a) Opening the ERA to the MPC, and (b) Establishing links and synergies with the MEDA programme. Given that the MEDA programme didn't include RTD activities, the inaction of the latter goal required the intervention of the Foreign Ministers, during their December 2003, Naples conference, by strongly encouraging the insertion of an RTD component in every priority sector. Moreover, "the Ministers underlined that Research and Technology Development (RTD) is an important tool for the economic stability and growth of all countries around the Mediterranean. They agreed that the opening of the European Research Area to all Mediterranean Partners can strengthen regional integration in the short term and can contribute to sustainable growth, high-value-added job creation, and the promotion of competitive economies in the region."

The Cairo Declaration ambitiously titled "Towards a Euro-Mediterranean Higher Education and Research Area," is a inter-ministerial agreement signed in June 2007 in Cairo. As its title indicates, it stipulates (i) creating a Euromed Higher Education System, and working (ii) towards the creation of a Euromed Research Area.

The Euro-Mediterranean Charter for Enterprise [8] attempts to make of the Euro-Mediterranean region a vast area of free trade and economic prosperity. Among its actions one finds:

1. Tailoring universities curricula to the needs of innovative companies,
2. Promoting links between higher education, research and industry,
3. Ensuring the rapid development of knowledge-based services in MPC,
4. Strengthening MPC companies participation in national, European and international technology programmes,
5. Encouraging MPC companies participation in international R&D projects.

2.3. Relevant programmes/projects/actions:

The EU-MPC S&T cooperation is covered by a plethora of instruments. Among such instrument, we list the following:

1. The Tempus, Erasmus Mundus and Marie Curie programmes
2. The Framework program,
3. The Competitiveness and Innovation Framework program (CIP)
4. The Euro-Mediterranean Industrial Cooperation program
5. The ENPI Regional Indicative Program for the Euro-Mediterranean Partnership
6. The ENPI Cross-Border Cooperation program (CBC)
7. The Technical Assistance and Information Exchange (TAIEX) program
8. The Twinning Instrument
9. The IncoNet Mediterranean Innovation and Research Coordination Action (MIRA)
10. The EUROMEDCONNECT project
11. The Facility for Euro-Mediterranean Investment and Partnership (FEMIP)

A quick look at the above list reveals important information about the structure of the intended systemic nature of the EU-MPC RTD cooperation. In fact, just the eleven components listed above span the quasi totality of what might become a Regional Innovation System (RIS). Unfortunately, many barriers prevented the emergence of a coherent research and innovation dynamics capable of contributing even further to growth and thus more well being. In this context, the following main three barriers are provided:

1. The absence of a globally harmonising and coherent framework,
2. The lack of “soft” use of knowledge, and
3. High-Tech/Public Organisations bias.

3) Definition of the main elements for a medium to long term agenda of Euro-Mediterranean Cooperation in Research and Innovation:

3.1. From the “What?” to the “How?”

Now, the pressing and strategic Question is NOT as much “What?” but rather and necessarily “How?” For, as well known and as augmented above, plenty is being done and much money and energy are being spent to achieve the collectively desired goals, but the willed outcomes and the expected impacts are far from what is hoped-for! Is the framework experiencing a systemic failure?

Nowadays, and more than ever before, it is acknowledged that innovation contributes to the enhancement of living standards. Furthermore, it is attested that the process of innovation requires a viable “Innovation System” (IS). This system could be geographical (supranational, national, sub-national) or technological. It is composed of all subsystems that constitute its innovation capacity, such as firms, universities and research centres, the educational system, the financial institutions, regulatory bodies and others. It is important to note that the innovation process is complex and is systemic in nature.

Europe 2020, and Horizon 2020, belong to the same lineage of more than a decade old Lisbon, and its companion knowledge-oriented strategies (CEC 2000). In fact, the EC aimed and still aiming at closing competitive gaps between Europe and the United States and Japan by building an innovation oriented strategy around the concept of a European Research area (ERA).

It is worth mentioning, that among the main motivations behind the ERA concept is the coordination of research and innovation policies with the complementary EU guidelines and national ones. According to the EC, the ERA concept was and remains the adequate means to (i) mobilise further funding, (ii) create appropriate environments to stimulate research and exploit results, and (iii) consolidate activities and pool resources.

3.2. Euro-Mediterranean Innovation Eco-System (EMIES)

Innovation wasn't included in the Barcelona process. However it is a priority in Europe 2020, Horizon 2020 and in A Partnership for Democratic and Shared Prosperity with the Southern Mediterranean. These strategies are meant to build the Innovation Union with, among others their Southern neighbours, by learning from past experiences, good practices within and outside of the EU, and providing remedies to already identified hindrances.

Indeed, these strategies propose "novel" measures to achieve better governance and simpler procedures, further cooperation and more efficiency. As a matter of fact [6] claims that "the regional situation demands that the positive elements of the Barcelona process, together with those of the Union for the Mediterranean be integrated in a new approach." Moreover "...UfM needs to reform to fully realise its potential. It needs to work more as a catalyst bringing States, International Financial Institutions and the private sector together around concrete projects generating jobs, innovation and growth that are badly needed in the region. ...The High Representative and the Commission are ready to play a bigger role in the Union for the Mediterranean in line with the Lisbon Treaty."

To simultaneously respond to the above aspirations and eliminate the identified barriers, it is proposed to progressively restructure the cooperation framework between key Euro-Mediterranean institutional actors, strategic projects along the lines of the EU flagship initiatives, by progressively moving away from the ERA concept the Euro-Mediterranean Innovation Eco-System (EMIES) one.

The key idea behind EMIES is to map the Euro-Mediterranean innovation space in three types of innovation sub-regions: (1) National Innovation Systems (NIS), (2) Regional networks of NISs, resulting in Regional Innovation Systems (RIS), and (3) integration of the different NIS/RISs into the EMIES.

A similar, albeit less elaborate idea was actually proposed [3]. It is also striking to discover that the full fledged RIS concept has been introduced and managed by DG REGIO since the early 90s and provides a valuable experimental phase to build on. The RIS project evolved into today's Regional Innovation Strategies for Smart Specialisation (RIS3), by transiting through the Eastern countries RIS. In addition, DG REGIO published recently a report in relation to the Structural and Cohesion Funds where the key findings and recommendations corroborate with those in this paper, but again, fails to pursue/recommend an overarching IS framework.

The three levels EMIES framework has a triadic advantage set: (a) reducing the variety of the difficulties thus eliminating the barriers, (b) integrating geographically close NISs, and (c) streamlining the policies and governance systems. In addition, it will give rise to much needed new complementarities and synergies between its different components, especially countries and regions.

While the above scheme allows some degree of simplification dealing with innovation over a vast geographic area and diverse socio-economic contexts, it requires a certain degree of decentralization be it on the institutional and/or financial levels. The regionalization, decentralisation dichotomy need to take into consideration the “apparent trade-off between the use of resources for the diffusion of knowledge in the peripheral parts of the continental economy (widening) of for generating new knowledge in the core countries (deepening). ... This may serve the twin objectives of encouraging learning in the peripheral areas and advancing knowledge in the core areas.” [9]

3.3. A Three Phases medium to long term agenda

Phase I (2012-14): Further convergence while preparing the future:

1. On the EC level:
 - i. Initiate work on supranational EMIES by building on past EC experiences, e.g., DR REGIO, the US Innovation System, and available literature,
 - ii. Identify and map the EU RISs, existing and potential ones, and identify best practices, and potential causes of failures for future policies design and streamlining,
 - iii. Align, as much as possible, ERA’s and others ongoing programs and project with EMIES especially its three spatial levels, i.e., national, regional and Eu-Med,
2. On the MPC level:
 - i. Benchmark the National Innovation Systems (NIS) of the North African countries, and help identify new promising industry/service niches,
 - ii. Identify R&D priorities, missing policies, and S&T policies/managerial capacity building in coherence with (i) and the new framework,
 - iii. Accelerate the convergence of MPCs to ERA and the European Higher Education Area, especially the Bologna process, with emphasis on educational and R&D institutional governance and autonomy, e.g., universities,

Phase II (2015-17): North African ISs and EU RISs emergence:

1. On the EC level:
 - i. Facilitate the emergence of the identified EU RISs,
 - ii. Assist in creating the North African IS (NAIS), while consolidating the North African NISs.
 - iii. Finalise the blue print needed for the launching of EMIES,
2. On the MPC level:
 - i. Implement the needed changes to facilitate the emergence of their NISs,
 - ii. Initiate the needed transformation to adopt the identified industry/services niches,
 - iii. Actively contribute, with the remaining North African countries and the assistance of EC, to the creation and emergence of the NAIS.

Phase III (2018-20): Viable operation of EMIES:

1. On the EC level:
 - i. Progressively launch EMIES,
 - ii. Evaluate, monitor and adjust the NISs and RISs to better fit EMIES,
 - iii. Revisit EMIES blue print such as the vision and strategies, along with the related programs and project to sustain the new framework and enhance its viability.

2. On the MPC level:
 - i. Run effectively their NISs in coherence with NAIS,
 - ii. Contribute effectively to NAIS and insure the coherence with EMIES,
 - iii. Fully engage via their respective NISs and NAIS, and participate in the governing bodies to sustain and enhance the viability of EMIES.

4) The Recommendations:

After a rich and constructive exchange, all the participants of Session 9, agreed to make the following recommendations:

4.1. Most important issues to focus on:

- Innovation in all sectors and themes, such as SHS, is much needed for prosperity and well being,
- Capacity building: new ways of educating towards a non traditional way of thinking,
- Large Euro-Med R&I projects as a means to achieve prosperity via cooperation.

4.2. Main challenges to be addressed:

- Equal partnership and common long-term targets with emphasis on inter/intra-regional cooperation,
- Implication of the private sector and NGOs at all levels and needed activities,
- Suitable and simple governance framework, to facilitate the emergence of the needed synergies and enhance the efficiency of the Euro-Med activities.

4.3. Priorities for action – key next steps:

- Call for the follow-up of the Cairo conference with the involvement of the private sector,
- Harmonize/align the overall legislative framework especially the IPR one,
- Initiate progressively a suitable governance framework and action plan to enhance innovation at the national, regional and Euro-Med levels for the well being of the Euro-Med community and humanity as a whole.

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