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Identifying barriers to Academia-Industry relationships in the MPCs, and their impact on Research and Innovation cooperation between the EU and MPCs

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Abstract. Collaboration between Academia and Industry at both national and international level is a pivotal issue to strengthen competiveness of countries and face major future challenges. The inputs needed to develop such a kind of cooperation and the main barriers hampering the implementation of joint activities are analyzed in this paper taking into account the results of a survey carried out in the framework of the MIRA project. Finally some suggestions are provided to support the implementation of policies and instruments aimed at enhancing the necessary links and contributing to the establishment of a Euro-Mediterranean Innovation Space.

Keywords. Industry – Partnership – Governance – Financing – Communication – Infrastructure.

Identification des obstacles aux relations Université-Entreprise dans les PPM et leur impact sur la coopération entre l'UE et les PPM en matière de recherche et d'innovation

Résumé. *La coopération université-entreprise à l'échelle nationale et internationale est un enjeu majeur pour accroître la compétitivité des pays et faire face aux grands défis du futur. Dans cet article, en nous appuyant sur les résultats d'une enquête menée dans le cadre du projet MIRA, nous allons analyser les éléments nécessaires pour donner une nouvelle impulsion à cette collaboration et les principales contraintes qui limitent la réalisation d'activités communes. En plus, nous allons fournir des indications pour encourager la mise en œuvre de politiques et d'instruments visant à renforcer les liens nécessaires et à contribuer à la création d'un Espace euro-méditerranéen d'innovation.*

Mots-clés. *Entreprise – Partenariat – Gouvernance – Financement – Communication – Infrastructure.*

I – Introduction

One of the main objectives of the INCO-Net Project MIRA is promoting stronger interaction between the research systems in the EU and in the neighbouring Mediterranean Countries (hereinafter referred to as MPCs), paving the way to the development of a Euro-Mediterranean Innovation Space (EMIS).

Therefore a study was carried out to identify the main barriers to the participation of MPC institutions and research centres in the European Framework Programme for RI, and the difficulties in bridging the communication and collaboration gap between Academia (Universities and Research centres) and Industry in the MPCs, being firmly convinced that these two issues are strictly related and represent the two pillars of the future perspectives of research and innovation driven international cooperation.

II – The survey

The survey was conducted by a MIRA team and the results were delivered to the European Investment Bank which is carrying out the IT1 Programme: “Fostering Innovation and supporting the promotion and financing of Innovation in the Mediterranean Countries”. Indeed one of the IT1 components is the “Diagnosis about barriers to innovations” (Benraad, 2011) whose main objective is identifying and analyzing issues that may inhibit the development of systems to support innovation, particularly in the field of the relationships between the academic/ research and industrial world.

The survey was based on a Questionnaire intended for the coordinators of projects co-financed under the ERA-WIDE activity of FP7 (2007-2014) Capacity Programme. The ERA-WIDE is aimed at reinforcing the cooperation capacities of well evaluated research centres located in the ENCs (European Neighbouring Countries) and working in the scientific domains covered by the thematic priorities of FP7 and involving stakeholders and industry representatives. It does not support directly research work, but contributes in order to improve the centres’ capacity to participate in the FP and to upgrade their infrastructure and international connectivity. The beneficiaries of ERA-WIDE projects may represent a significant sample of Research Centres in the MPCs with international cooperation activities, and were taken into account as the target of a pilot study on International Cooperation and Academia-Industry cooperation, based on their previous and current experiences.

The survey was focussed on the experience of research institutions in National cooperation and MPC-EU International cooperation, if any.

Therefore, two separate sets of answers to the same questions in the National and International context were collected through the Questionnaire which served as the survey base. The respondents were asked about the barriers which the industry has to face to interact with Universities and Research centres in National Initiatives and in International Cooperation. Answers were based on an extensive list of barriers and types of engagement and were divided according to the four key issues to improve cooperation activities.

The results are summarized in six figures:

1. Pros that had an impact on your decisions to start cooperation projects with Academia/ Industry (as in Figure 1);
2. Cons in deciding to start cooperation projects with Academia/Industry (Figure 2);
3. Main results/impact achieved when participating in the projects (Figure 3);
4. Main problems faced when participating in the projects (Figure 4);
5. Instruments for Academia/Industry cooperation (Figure 5);
6. Suggestions to improve RTD cooperation between Academia/Industry (Figure 6).

The list of ERA-WIDE Projects for which the Questionnaire was submitted is provided in Annex 1.

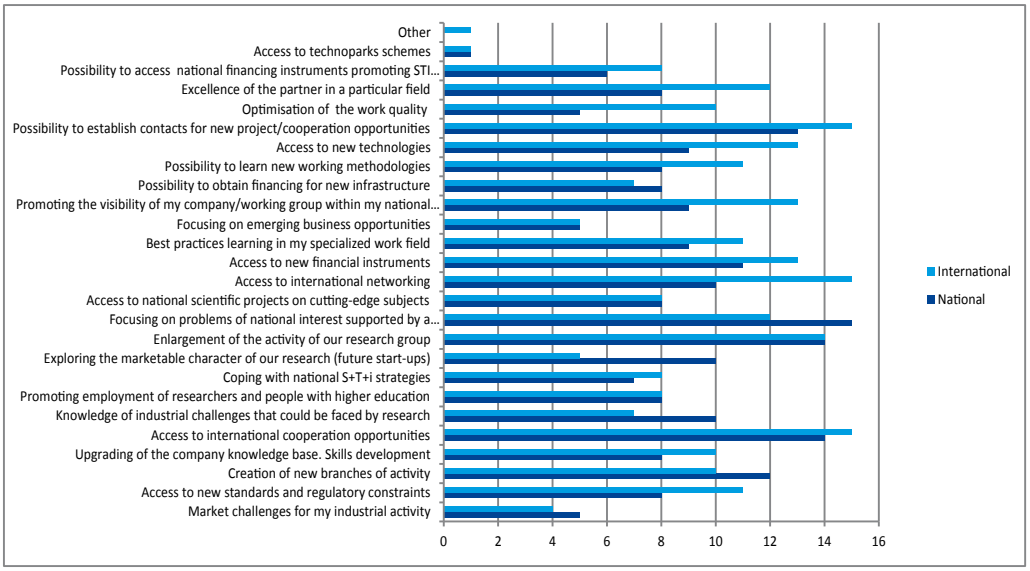

Figure 1. Pros that had an impact on the decision to start cooperation projects with Academia/Industry.
Source: MIRA *project survey to erawide coordinators.*

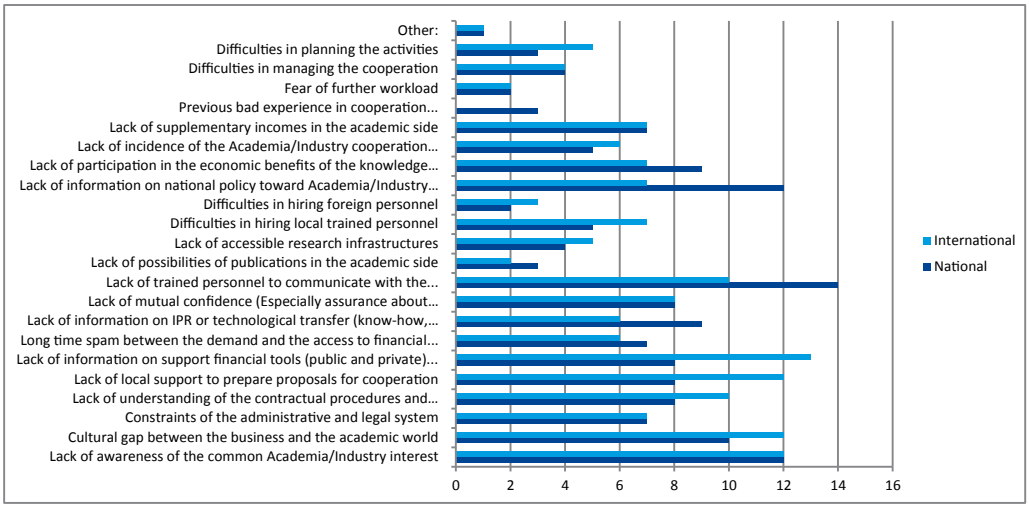

Figure 2. Cons in deciding to start cooperation projects with Academia/Industry.

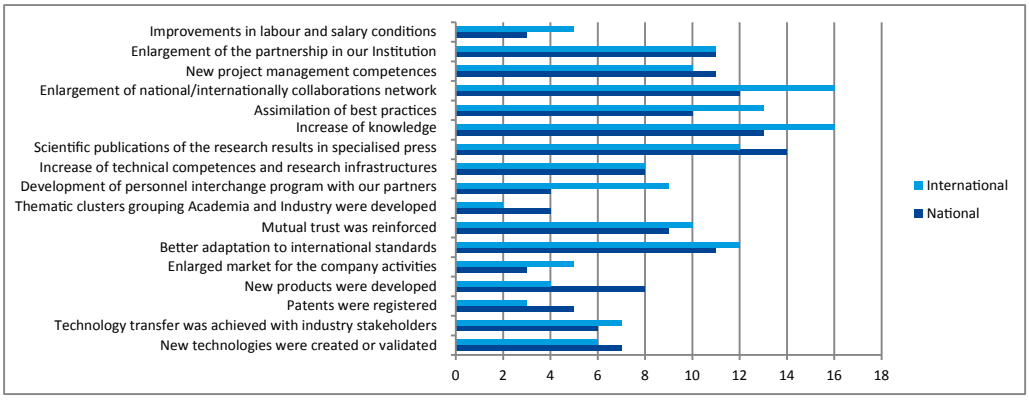

Figure 3. Main results/impact achieved when participating in the projects.

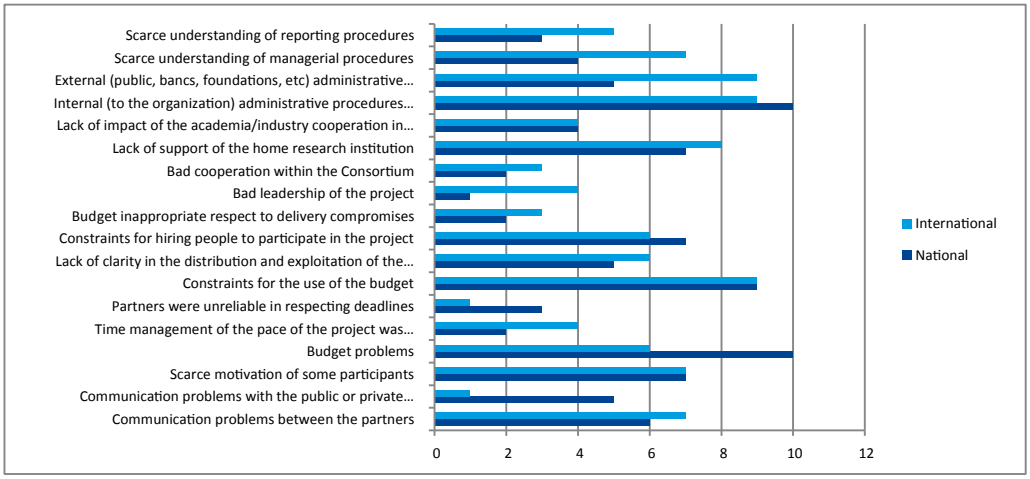

Figure 4. Main problems faced when participating in the projects.

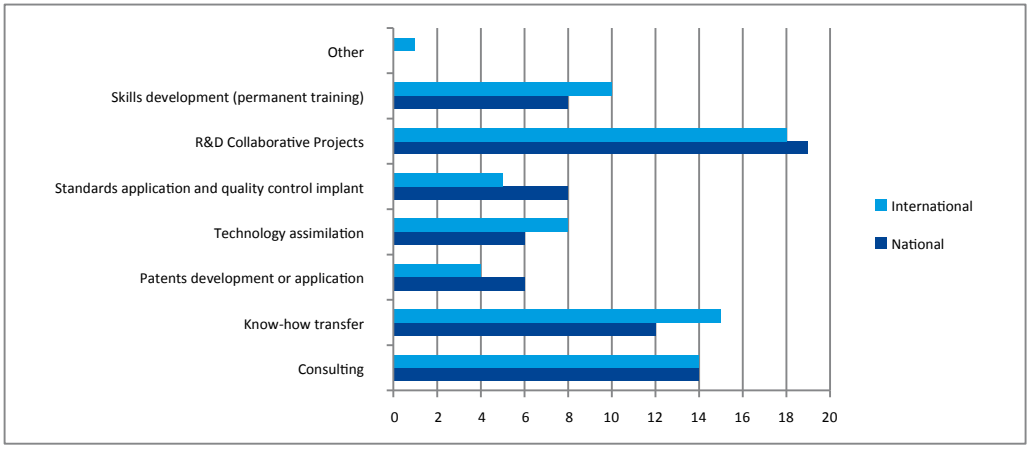

Figure 5. Instruments for Academia/Industry cooperation.

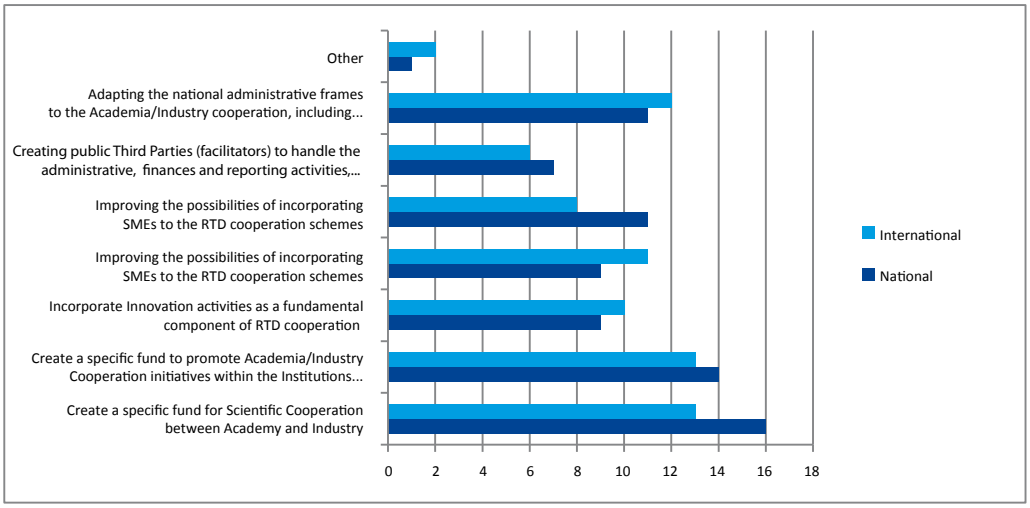

Figure 6. Suggestions to improve RTD cooperation between Academia/Industry.

III – Inputs and barriers to start cooperation between Academia and Industry projects

1. Inputs and barriers at national level

The opportunity to have a greater visibility and enlarge the scale and the scope of research at home is one of the main inputs to start cooperation projects involving both Academia and Industry at national level. Since the European Union is urging action to have industry more and more represented in cooperation projects co-financed by the European Commission, the possibility to start cooperation involving industries at national level is recently regarded as an opportunity to face competition in RI projects at community level (Fig. 1).

At the same time many problems still hamper Academia (Research)/Industry cooperation at national level.

First of all, many Mediterranean Partner Countries still have little awareness of the importance of this collaboration. The reasons range from the lack of incentives to mobility between the two sectors to the difficulties in finding proper partners, from cultural divide to poor communication about available opportunities.

It is a fact that industries and entrepreneurs are more often interested in fully recovering their investment in a short time. They know that research and academic activities may enhance and raise product standards, which in turn increases the benefits, but they lack a strategic long term vision that could be really useful to improve their technological skills. Moreover, the Industry in the Southern and Eastern Mediterranean Countries mainly consists of Small and Medium Sized Enterprises (SMEs) that have often no funds and no human capacity to start new cooperation projects with the Academia or projects in the arena of international cooperation. More information/ publicity and capacity building for such a “sophisticated” partnership is needed by the industrial sector, and some funds should be allocated to motivate industrialists to take the risk of investing time and human resources in these initiatives.

Several experts reported also that the level of awareness in the relationship between Industry and Academia is still in its infancy, also as regards research representatives, and that integrated initiatives and an extensive programme are required to bridge the gap.

It is worth mentioning here the efforts made by some governments in the Mediterranean countries such as Algeria with the ANVREDET - Agence Nationale de Valorisation des Résultats de la Recherche et du Développement Technologique -, and the ANDPME - Agence Nationale de Développement de la PME.

At the same time, little is known about the role that the International Financial Institutions could have in supporting cooperation between Academia and Industry in the Euro-Mediterranean region, especially for the infrastructure, while the potential for loan schemes and incentives to spur spin offs, incubators and labs should be increased.

As illustrated in Figure 2, other barriers hamper the process towards a closer cooperation between Industry and Academia:

- poor coordination among different institutions (Scientific Research/technical Ministries such as agriculture and industry);
- ad hoc measures to enhance capacity building of SMEs to trigger innovation processes.
- lack of joint initiatives of “training by doing”;
- lack of national incentives for Universities and Research institutions to make them closer to the business world;
- few networks of services providers and agencies specializing in research commercialisation (clusters, incubators, centralized and decentralized development of research, specialized financial institutions);
- non-effective communication strategies concerning opportunities for Academia-Industry cooperation;
- non-effective information on IPR issues;
- despite the encouragement and various efforts to develop Academia/Industry cooperation, effective cooperation remains very difficult.

2. Inputs and barriers at international level

With the forthcoming EU Framework Programme for RI, Horizon 2020, innovation will be the key issue in many cooperation initiatives that will be co-financed by the European Commission. Cooperation between Academia and Industry on specific objectives of common interest is therefore regarded as an urgent need.

The new EC strategies are a good incentive to start cooperation fully involving stakeholders and entrepreneurs. However the same barriers that hamper cooperation at national level seem to affect also international projects, as shown in Figure 2.

Indeed the experts indicated a large number of Academia-Academia international projects, dealing with innovation aspects, where they expected more impact and participation by Industry. However, in most cases, only services companies were involved, particularly those in the ICT sector.

At the international level, as on the national scale, the level of awareness about the relationship between Industry and Academia is still low and as a result, it is important to develop an intensive programme with a view to enhancing capacity building and spreading relevant information.

The encouragement and development of cooperation between Industry and Research should fall within various frameworks:

- Programmes under the Association Agreements with the EU.
- Twinning, joint projects co-financed by the European Commission.
- Programmes of the Mediterranean and Arabic area, co-funded by participating countries.
- Global partnership programmes on specific issues, such as those of ICARDA (International Centre for Agricultural Research in the Dry Areas), IWMI (International Water Management Institute), IFPRI (International Food Policy Research Institute) and so on.
- Bilateral cooperation.

In particular, new South-South cooperation projects should envisage the full involvement of Industry representatives and of the civil society.

The results will be two-fold: linking research to society and the economic needs while attracting Industry and young entrepreneurs to the new horizons opened by research. Finally it could be easier to understand the benefits that could derive from cooperation.

Other actions which have to be taken into account are the following:

- Possible future Academia-Industry collaboration out of ERAWIDE FP7 projects should be implemented.
- As at the national level, access to information and training is still limited. Awareness campaigns could be useful to promote Academia-Industry cooperation. Moreover, research institutes should use the media to inform about the specific benefits that the Industry could take from Research institutes capability.
- Adoption of appropriate legal, financial and administrative frameworks to facilitate the involvement of small and medium-sized enterprises (SMEs).
- Development of instruments more useful to support young entrepreneurs and innovative ideas (i.e. training/coaching).
- Further support to capacity building and mobility through ad-hoc schemes.

IV – Pros and Cons faced in projects involving Academia and Industry

1. Pros and Cons at national level

One of the main results of scientists' participation in projects involving both academia/research and Industry representatives at national level is a deeper knowledge of the impact that their work may have on production and competitiveness in their country. Both Academia and Industry representatives can witness that this may open new branches of activities and new prospects of cooperation at national but also at international level. They can together cope more effectively with national ST strategies while enhancing capacity building of their firm, body or institution.

Among the main results, mention should be made of the increased number of scientific publications, as reported in Figure 3. At the same time, there are many problems to be faced, as illustrated in Figure 4.

One of the most relevant issues is related to the heavy administrative and financial procedures. However, in practical terms, the biggest challenge is without doubt the heavy and complex procedure to mobilize funds (4-5 years minimum), which discourages many initiatives. Sometimes it also happens that the allocated budget is not available in the project starting phase and this makes things more complicated.

Moreover, poor communication and gaps in priorities are a difficult challenge to take up since each side does not fully understand the other`s motivation and language, due to the poor mutual knowledge of their respective cultural background (in terms of the day to day practice) and expectations. The result is the lack of trust.

Another issue is the lack of information about opportunities they have and also of knowledge about the infrastructure they could share, as it is – for example - in Palestine. One of the experts illustrated a particularly interesting problem: in the field of therapeutics, involving research on safety and efficacy of prototypes and production of recombinant therapeutic proteins. The main obstacles to cooperation between the research centre and Industry were the following:

- There was neither a collaboration context nor a clear contract procedure. All aspects concerning collaboration were discussed and decided at a personal level by the person responsible for the laboratory, without a clear legal framework, even if the collaboration experience deals with both governmental and private pharmaceutical companies: the main obstacle for governmental pharmaceutical companies was bureaucracy, while for the private companies the frequent change of the Company's head of research department reflecting on policies represented the main problem.
- The lack of clear rules on how to proceed with commercialization. Diagnostic kits for schistosomiasis and fascioliasis, for example, were kept on the shelf despite their proven efficacy at national level.

2. Pros and Cons at international level

Capacity building in dealing with international projects is one of the main results achieved, along with the use of best practices, increase in knowledge and technology base, as indicated in Figure 3.

This can partially balance the difficulties faced in implementing international cooperation activities: heavy administrative procedures, problems related to the harmonization of national and international rules, difficulties in reporting, as described in Figure 4.

Another aspect relates to some misunderstanding in the partners' role.

In several Mediterranean countries the following hurdles to regular cooperation still exist:

- Complexity of the procedure for the earmarking of funds based on several assessment and control steps, before being available to the research team. In addition, the procedure for the purchase of heavy equipment such as measuring devices, analysis or testing devices is extremely long.
- Hiring a person (assistant, technician, or even PhD to carry out an investigation for example ...) is submitted to the constraint of allowance threshold and the long time needed before signing a contract procedure. Thus, good quality candidates are not interested and the project coordinator spends his/her time in simple administrative tasks that could be performed by a less qualified person hired by a contract.
- A certain level of prejudice of EU Countries against the scientific quality of MPC partners to build real win-win relationships leads to waste opportunities.

The differences in time management and professional objectives, as indicated before, raise problems between researchers and industrialists: researchers want to have time for their R&D work and they wish to publish the results obtained as quickly as possible, while industrialists want to obtain and apply results quickly. The two groups have the feeling that they work according to a different time schedule, doing a different business.

Companies find it difficult to involve the University and research centres players in these programmes for which the latter receive no direct benefit. Research centres are exclusively focused on their core business: research.

As for national projects, there are also difficulties in communication between economic companies, administrative institutions and the research institutions. This landscape has to change incorporating the goal of supporting the production system innovation in the mission of the research centres.

In fact at present scientists and industrialists seem to talk a different language. This poses a communication problem that can be faced by improving the communication gates between the two sectors.

It is clear that policy makers, business people and also scientists involved in international cooperation strategies and actions should develop joint strategies and instruments to overcome these barriers that are seemingly insurmountable.

V – Suggestions to improve collaboration between Academia and Research

As reported in Figure 5, the survey was also useful to gain a better understanding of how to face the barriers described earlier.

It is suggested that, at both national and international level, a specific fund be created to spur links, new measures in EU funded projects be laid down to enhance participation of SMEs and improve Academia/Industry mobility schemes.

The results of the present survey were discussed in the "International Conference on Mediterranean Countries and EU Opportunities" (Pancera, 2012), held in Amman in October 22nd-23rd 2012, bringing together national and international policy makers, EC representatives, coordinators of projects co-funded by the European Commission, Industry representatives and stakeholders. The following suggestions were additionally included in the list reported in Figure 6:

- Need to design specific programmes more adapted to the Euro-Mediterranean region and field conditions.
- Further support capacity building and mobility through regional and co-financed schemes inspired from the ERA-WIDE, REG POT, IAPP and IRSES including South-South and North-North.
- Provide further support, guidance, coaching and expertise on how to turn the strategies into business plans complying with banks' criteria.
- Take advantage of ERA-WIDE experience as a basis for future activities through dissemination actions which should involve researchers, industry, the public and policy makers, clustering of EU funding recipients to show the impact, ROI (Return on Investment) as well as success stories to raise awareness about the importance of lifting barriers to success, maintenance of a regional platform to enhance the field experience.

VI – Comments

The survey analysis has highlighted some significant results which have provided the basis for an interesting discussion during the Amman Conference.

The starting point of cooperation at national or international level is more often the outcome of personal contacts, so gathering anonymous institutional information has a lower impact than favouring personal acquaintance.

There is a real public concern to improve Academia-Industry cooperation, but the available instruments - financial or of any other kind - are not appropriate and their management is discouraging. The internal organization of the research system and its legal framework are inconsistent in many regards and the qualification of the personnel in charge of the programme is low and consequently, the criteria adopted for resource allocation and management are not always relevant.

In the MPCs Academia and Industry should commit themselves more in joint research on standards, technology assimilation and knowledge transfer. A real patent policy should be developed with all the consequences involved, particularly in terms of financial and legal support, beyond voluntarism.

The Academia-Industry cooperation should be focused on strategic areas of national and regional interest in order to facilitate the internationalization of research and innovation efforts.

VII – Conclusions

As clearly indicated by the survey, at national level, most of the experts involved agreed on four main factors which hamper Academia/Industry collaboration:

- Cultural gap between the business and the academic world.
- Lack of qualified personnel.
- Lack of information about a policy directed towards Academia/Industry cooperation.
- Lack of participation in the economic benefits deriving from knowledge exploitation on the academic side.

At international level, the main issues are the following:

- Poor information on financial instruments and programmes (public and private).
- Difficulties in managing the resources allocated, poor capacity to prepare proposals for cooperation and scarce support by public administrations.
- Lack of awareness of the common Academia/Industry interest in the international arena.

At the national level the main hurdle to cooperation is represented by the internal administrative procedures in public administrations which are too complicated, along with the budget limits and the constraints on the use of resources.

At the international level the main problems are that the external (public, banks, foundations, etc.) and internal (inside the organization) administrative procedures are also too complicated, mainly due to the constraints on the use of the budget allocated for the international project.

In the light of the expansion of a Research, Development and Innovation (RDI) policy in the MPCs, the upgrading of education quality and the development of information and communication infrastructure prove to be fundamental to promote a knowledge-based economy. This could

also be a key enabler for MPC's efforts to meet the challenges of an innovation chain, i.e. all technical, financial and training mechanisms needed to support innovative projects throughout their duration, from the very beginning of the cycle to the final financing and exploitation phases.

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Annex 1

The list of ERA-WIDE Coordinators that answered the survey.

Name	*Surname*	*Project name*	*Country*	*E-mail address*	*Institution*
Abdessalam	El Khanchoufi	MAP2ERA	Morocco	elkhanchoufi@yahoo.fr	National Institute of Medicinal and Aromatic Plants (NIMAP)
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Ali	Ferrah	FAWIRA	Algeria	aliferrah@gmail.com	Institut National de la Recherche Agronomique d'Algérie (INRAA)
Noureddine	Gabouze	NASERA	Algeria	gabouzenoureddine@udts.dz	Unité de Développement de la Technologie du Silicium (UDTS)
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Sonia	Abdelhak	GM_NCD_in_co	Tunisia	sonia.abdelhak@pasteur.rns.tn	Institut Pasteur de Tunis (IPT)
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