

Working Group on Research Cooperation Final Report

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Introduction

The visions and missions of Academies associated in ALLEA have many similarities and numerous common fundamental objectives and goals. Some of them are here ordered and presented in a limited format following the WG area on research cooperation.

The set of objectives of Academies united under the umbrella of ALLEA is briefly the following¹

- Advancing the frontier research in all the scientific and scholarly disciplines;
- Enhancing critical scientific thinking in a society, *i.e.* approaching the knowledge-based society;
- Promoting of independence and freedom of science, by removing barriers and building bridges.

All the Academies have the same objectives in their respective countries. ALLEA as an independent and multiscience / multi-scholarship institution works as a whole for policy for science and can give “authoritative opinions, judgements, evaluations, advices on the promotion of science and science policy”.²

The ALLEA WG on research cooperation carried out the comparative study on similarities and differences in the best practices of cooperation and exchange between the Academies. Information provided by the Academies about their international activities at their web sites and through other media proves that the need to support co-operation (incl. cross-border mobility) is never an issue. The careful selection of the

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² ALLEA. Strategic Outlook: Unity in Diversity. Materials of the ALLEA Steering Committee meeting, Rome. 27-28 October, 2005.

best instruments of international co-operation and tools for progress evaluation are the essential questions on the agenda.

General situation

Research cooperation and exchange is a must for Europe and certainly stretched beyond the European geographical area. The EU policies and targets (Lisbon, Barcelona) have a clear goal – creating the European Research Area (ERA) with tight links to the European Higher Education Area (EHEA). The EU Framework Programmes and the corresponding instruments channel EU funds to research and development following the ideas of cooperation in ERA. Certainly there are many other actors uniting the national funding like ESF and EUROHORCs, fostering excellence and public understanding of science like ISE, Euroscience, Academia Europaea, European Academy of Sciences and Arts etc and giving advice on R&D matters like EASAC, EURAB, etc.

The recent study of UK OST³ has listed the number of instruments that facilitate international research cooperation starting from Article 169 from EU. They include general instruments like COST actions, ERA-NET, EUROCORES and *à la carte* Programmes (ESF), EURYI and Transfer of Grants (EUROHORCs), EUREKA clusters and umbrellas and specific directed instruments for facilitating research through the Human Frontier Science Foundation grants or the mission specific platforms of the European Consortium for Ocean Research Drilling.

In this complicated and diverse landscape, ALLEA and the Academies should use all the existing potential of their members elected by their excellence in science, to follow the objectives briefly described above. Research cooperation of Academies is one of the instruments moving towards objectives. There are several opportunities for cooperation:

- (i) The cooperation co-ordinated by ALLEA which means:
- Promoting the exchange of information and experience between Academies;
 - Collecting advice to EU science, social and economic policy from member Academies;

³ OST Report European Frameworks to Facilitate Multilateral Cooperation between National R&D Programmes, London, Oct 2005.

- Promoting excellence in research, high ethical standards and independence of Academies.
- (ii) The cooperation between the member Academies. This could involve:
 - Bilateral and multilateral exchange schemes of researchers with more stress on joint projects;
 - Joint projects on science policy analysis (regional, EU, international level);
 - Bilateral and multilateral schemes on information exchange and on public understanding of science;
 - Joint research projects if Academies are conducting direct research in research institutes/units under their umbrella;
 - Joint conferences, seminars, workshops, etc.

In terms of research fields all activities can be divided approximately into two streams:

- Research in fields where there are no fundamental differences between the countries (research in physics, mathematics, chemistry, technology, sustainability, biodiversity, etc.) and joint projects can be easily launched, although the level of needed infrastructure may be different;
- Research in fields which emphasize the diversity of Europe (history, languages, cultural studies, etc.) and joint projects may depend on geographical areas and linguistical practices; some of fields may be so-called 'orchid subjects' because of their limited scope but still needed to complete the general knowledge.

But such a classification should serve to emphasize only some special instruments needed for reaching the goals and not to build up preferences. It might happen that Academies are the major players for all embracing diversity studies.

The recent discussions on the co-ordination of national research programmes within the EU using the ERA-NET scheme (October 2005, Manchester) have shown that beside programmes, the co-ordination of smaller projects could need more attention. This might be again the task of the Academies.

One threat to R&D in Europe might be characterized as follows. The environment requesting and ordering research, rewarding good accomplishments and seeking for knowledge transfer and development is rapidly diminishing. One of the reasons for that happening is because the industries (chemical, textile, software, electronics, etc.) are moving out

of Europe. However, the number of researchers in Europe is far away from estimates needed for accomplishing ERA ideas and the process of leaving Europe is still not stopped. In general terms, this is a question of values and benefits for Europe as a whole spiced with social problems. Can Academies be more inventive, assistive, and provide answers to the emerging difficult questions and dilemmas?

Last but not least, Academies are the best institutions to deal with basic dilemmas in research⁴:

- Equality versus efficiency;
- Individual freedom versus collective strategy and order;
- Spiritual versus material values;
- Short versus long-time thinking.

Presently, the problems of quality of research versus funding issues should be added. Given the traditions and various levels of scientific and scholarly research in different countries, the prospective interests and instruments may also be different and therefore regional cooperation is important. It must be noted, however, that the main reason for different levels of research is strongly dependent on rather big differences in the infrastructure and the lack of critical mass of researchers, but this is no excuse for not enhancing the performance.

Some examples of bilateral exchange schemes to enhance mobility

To enhance mobility of scientists and facilitate scientific networking, the Academies implement bilateral agreements. Over two thirds of 52 member Academies of ALLEA are woven into an intricate web of relationships by agreements and memoranda of understanding on scientific co-operation. In addition, this inter-Academy network connects Academies with funding agencies – research councils and science foundations, for instance Hellenic Research Foundation, Academy of Finland, CSIC (Spain), CNRS (France), etc., appear on the partnership lists of many Academies. Contents of the agreements vary widely, depending on the legal status, institutional regulations, priorities and preferences of partners; however, the majority stipulate for bilateral exchange programmes at a smaller or larger scale.

⁴ J. Engelbrecht, National strategies of research in the European context. In: National Strategies of Research in Smaller European Countries, ed by J Engelbrecht. ALLEA and Estonian Academy of Sciences, 2002, 17-28.

A number of Academies that implement bilateral exchange schemes participate in a loose network titled ESEP (European Science Exchange Programme). ESEP (incorporating later the humanities and social sciences) was founded in 1967, after a survey carried out by the Royal Society suggested that an increase in mobility amongst senior scientists and younger researchers across Europe was desirable. Twelve West European countries were represented at a meeting convened to explore the issue further, and it was agreed to invite applications for a number of short term visits, fellowships and small, specialised research conferences. The early programme supported a series of bilateral links between the Royal Society and partner countries, and gradually expanded to cover most of the countries of Western Europe. An annual meeting of partner organisations, chaired by the Royal Society, allowed the opportunity for discussions on the development of the programme.

During the 1990s, following the major political changes in Europe, the ESEP was extended to Central and Eastern Europe where the bilateral exchange schemes had also been implemented since 1960-ies. Schemes of support for joint projects were set up, moving the focus of the programme slightly away from the support of the individual scholar and towards an increased concentration on collaborative work. The ESEP Partners' Meetings continue to be a forum for discussion of bilateral co-operation issues.⁵

Nowadays, the Academies with research institutes under their umbrella are actively and quite extensively engaged in bilateral exchanges using them as a centralised mobility funding instrument. E.g. Austrian Academy of Sciences with over 40 bilateral agreements, Bulgarian Academy of Sciences (over 50 agreements), Hungarian Academy of Sciences (ca 70), Slovak Academy of Sciences (over 60), Academy of Sciences of Czech Republic (ca 60), count incoming and outgoing visits in hundreds, Polish Academy of Sciences (over 60 agreements) and National Academy of Sciences of Ukraine (over 50) - in thousands.

Academies without research institutes who lack significant funding opportunities depend on the availability of resources (both budgetary and administrative) and - acting in accordance with the needs of the scientific communities of their countries - either operate exchange programmes at a more limited scale, complementary to other existing co-operation tools, or not at all, concentrating on other instruments appropriate for their strategic aims. The volume of visits under the exchange

⁵ Credits to the Royal Society/British Academy, 2003 for the history of ESEP.

programmes varies, starting from a couple of reciprocal study visits per year up to a few hundreds. The Norwegian Academy of Science and Letters, Royal Swedish Academy of Letters, History and Antiquities, Royal Irish Academy, the Academies of the Baltic countries, Slovenian Academy of Sciences and Arts, etc. are good examples of effective running of a scientific exchange programme.

Traditional bilateral exchange programmes offer support to individual scientists and scholars, often of postdoctoral or equivalent level, for short-term and/or long-term visits (usually covering travel for outbound researchers and subsistence for visiting researchers; however, mixed schemes exist deriving from preferences and possibilities of partners). Rationale for such a visit can be joint research, participation in scientific events; in some cases also archives and/or library studies or establishing of initial contacts are eligible objectives. Aiming at tangible outcome, better balance in East-West and North-South mobility directions and cost-effectiveness, a number of Academies support mutually assessed and approved joint (common) research projects. Projects are run over a period of 2, 3 or 4 years, with reciprocal visits between collaborating teams every year. Quite often Academies hold the joint projects as a priority over the individual visits (*e.g.* case for Bulgaria, Hungary, Poland, etc.) or run the schemes for individual visits and joint projects separately (the British Academy, Royal Society). However, since individual studies play a more important role in the humanities and social sciences, a formalised joint project might be rather artificial in some cases and therefore the Academies prioritising joint projects leave usually the door open also for 'free' visits.

Some national Academies act as significant national R&D funding bodies and have adopted various funding schemes for supporting international co-operation. Irrespective of the existence of formal agreements, focus seems to be shifting from the traditional bilateral exchanges to integrating the funding of mobility and bilateral co-operation into general structure of research funding or to providing travel grants (both for outgoing and incoming visits) through the native (resident) researchers. The best example is the Royal Society (bilateral agreements with most Academies all over the world) with its multiplicity of funding instruments (co-operative research grants, international joint project grants, conference grants (both in and out of the UK), incoming and outgoing fellowship schemes, short visits grants to/from UK), with the aim of supporting excellent research and brightest brains.

The British Academy provides extensive funding and support for collaborative research through agreements and country-specific programmes, but additionally provides travel grants irrespective of the existence of agreements.

After the first boom of bilateral exchange schemes in the seventies, the first half of the 1990s witnessed a fast expansion of bilateral contacts (in quality and quantity) with the Academies of the post-socialist countries (CEE, Baltic countries). Nowadays, after a period of stability, the impact of new developments, in particular the enlargement of EU and implementation of specific EU instruments for enhancing collaboration and researcher mobility are compelling Academies to evaluate the efficiency of traditional funding instruments used for this purpose, finding the fields and forms of cooperation that best meet their needs and capacities.

The diversity and other schemes of co-operation

Academies concentrate their efforts along the lines of their best expertise and available resources in accordance with their chosen strategies of international co-operation. Agreements may stipulate for exchange of information and sharing of experience on evaluation of science and funding procedures; also including clauses on exchanging experts for evaluation purposes. A number of examples on other schemes follow.

The French Academy of Sciences runs a bilateral lectures programme (partners: the Royal Society, National Academy of the Lincei, Royal Netherlands Academy of Arts and Sciences).

Several Academies (*e.g.* Berlin-Brandenburg Academy of Sciences, French Academy of Sciences, Israel Academy of Sciences and Humanities, etc.) hold bilateral scientific workshops and symposia as a priority over traditional bilateral exchanges. Workshops are held on specific topics, bringing together experts, but also researchers at the early stage of their careers with the aim to encourage longer-term collaboration as well as to initiate collaborative research on this specific topic.

Cooperation cannot be confined within bilateral frames; a variety of multilateral tools exist. The participation in scientific events organised by Academies may be multinational, as is the case with high profile scientific colloquia arranged by the Royal Flemish Academy of Bel-

gium for Science and the Arts (20 per year). Since 1988, National Academy of the Lincei holds annual Amaldi Conferences on global security and arms control, bringing together representatives of many Academies worldwide. Hungarian Academy of Sciences has been the main organiser of the biennial World Science Forum (under the auspices of UNO, UNESCO, etc.), drawing global high-level participation of academia and policy-makers (in 2003 and 2005, the next one to be held in 2007).

There are several examples of regional activities. For example, regional cooperation in South-East Europe has been analysed by P. Drenth.⁶ The recent history of this region has been full of conflicts and struggles with stresses between countries here and there still alive. That is why scientific and scholarly community, especially Academies and also universities should join their efforts in view of the peaceful climate in SE-Europe with clear benefit not only for society but also for research if joining the forces.

Strong regional links find their outcome and are also encouraged by regional conferences tackling specific issues, but also providing forum for discussion of common strategies and policies. A tradition can be observed in several cases: V4 (Visegrad Four) Academy Forum, also regional conferences in the Baltic Sea area.

Traditionally Nordic Academies (in Denmark, Finland, Norway, and Sweden) have many forms of cooperation, incl. annual conferences. Now joining them are also Academies in Baltic countries (Estonia, Latvia, Lithuania). After reinstating the independence in Baltic countries in the beginning of 90-ies last century, the meetings of three Baltic Academies have been regular and starting from 1997, the regular joint meetings of Nordic and Baltic Academies have been held. Within these meetings, the Baltic Conferences on Intellectual Co-operation have been organized. The history of these conferences dates back to 1935 and the regularity was broken in 1940 by the Soviet occupation of Baltic countries. The tradition was renewed in 1999. The last conference in 2005 was held in Helsinki and was focussed on 'The Baltic: Past, Present and Future'.⁷ The overview on cooperation between the Academies of Baltic countries (1995-2005) was presented.

⁶ P.J.D. Drenth, Regional Scientific Collaboration in Europe: Opportunities and Challenges. In: ALLEA Biennial Yearbook, 2004, 247-259.

⁷ The Baltic: Past, Present and Future. Materials of the 10th Baltic Conference on Intellectual Co-operation. Helsinki, Finland, June 8-10, 2005.

A specific example of inter-Academy regional cooperation is the Central European Journal of Social Sciences and Humanities founded jointly by the Academy of Sciences of the Czech Republic, Hungarian Academy of Sciences, Polish Academy of Sciences and Slovak Academy of Sciences. This electronic journal publishes English abstracts of articles and reviews, which appeared in national languages in scientific journals of those countries.

To facilitate and enhance trilateral collaborations, the Estonian, Latvian and Lithuanian Academies of sciences ran joint research programmes (in energy research, Baltic Sea studies, in the humanities and social sciences) in the 1990s; such joint programmes are more widely spread between the Academies that conduct actual research (*i.e.* have a structure of research institutes). Also, Academies may manage specific programmes on behalf of their governments, for instance, the Royal Swedish Academy of Sciences receives a sizeable amount of funding that is allocated to projects run jointly by researchers in Sweden and in former Soviet Union republics.

The Royal Flemish Academy of Belgium for Science and the Arts manages the Flemish Academic Centre for Science and the Arts. Fellowships to foreign researchers enable them to work together with a Flemish colleague (3-6 months); a funding to the institution employing the Flemish partner is provided, to make a temporary replacement of the absent staff member possible.

The Royal Swedish Academy of Sciences is well-known globally for its administration of most prestigious scientific prizes - Nobel Prizes in chemistry and physics, the Bank of Sweden Prize in Economic Sciences in Memory of Alfred Nobel. International in essence and accompanied by the lecture programme, they can be considered as a tool to enhance international cooperation. On the basis of private donations, the RSAS awards also other prestigious international prizes: the Crafoord Prize, the Rolf Schock Prizes, and the Gregori Aminoff Prize. The global mathematical community knows the Norwegian Academy of Science and Letters for its international Abel Prizes. There are other examples – the joint Medal of the Estonian, Latvian and Lithuanian Academies of Sciences may not be known outside the region, still it is an instrument to highlight the contributions to Baltic cooperation.

The Polish Academy of Sciences is a good example of expanding the selection of cooperation instruments over frames of bilateral relations, simultaneously enhancing and enriching those relations. It has a long tradition of scientific centres abroad (in Paris, Rome, Vienna, Ber-

lin, Moscow) facilitating international contacts; initiated establishing international research institutions in Poland (*e.g.* S. Banach International Mathematical Centre, the International Centre of Biocybernetics, the French-Polish Centre of Plant Technology, etc.), carries a co-ordinating role of Poland's participation in international research centres abroad (CISM, Udine; IIASA, Laxenburg, etc.). Polish Academy of Sciences has also used organisations of Polish science days abroad as a means to raise the visibility of Poland.

The British Academy acts as the channel for governmental support for the British institutions engaged in academic research and fieldwork overseas (located in the Mediterranean region, the Near and Middle East, South and South-East Asia and East Africa). Their work is conducted in collaboration with a wide variety of academic institutions and authorities abroad and they provide the means to enable British scholars to undertake original research and fieldwork; in addition, those institutions offer an active programme of lectures, conferences and other activities.

Some Academies have introduced specific measures, in order to promote and facilitate participation in EU programmes (Austrian Academy of Sciences, Slovak Academy of Sciences); Academy of Sciences of the Czech Republic and Estonian Academy of Sciences act as bridgehead organisations in the ERA-MORE network, a network of centres designed to assist researchers moving to another country in all matters relating to their professional and daily lives.

In fact, the list of above examples reaches far out of strictly inter-Academy co-operation, exhibiting intertwining of bilateral and multi-lateral cooperation instruments.

General observations and impressions

Investigating the priorities and restrictions in cooperation, particularly in bilateral cooperation, it could be noted that many Academies would not admit having any. Of course, the scope of the activity fields imposes restrictions in the case of specialised Academies that exist, for instance, in Sweden, Switzerland, UK. The Academies managing their own research institutions tend to implement another constraint, excluding scientific community outside the Academy from their collaboration schemes. The Hungarian Academy of Sciences and Polish Academy of

Sciences are a firm exception here, though – those Academies impose institutional restrictions neither for their nominees for visits abroad, nor for researchers wishing to host foreign colleagues.

Lack of resources influences the volume of scientific exchanges in negative direction, raising a greater need for variety of cooperation tools and for the greater support of partners. On the other hand, also does a better funding affect the specific mobility instruments – countries affording a better R&D funding, tend to provide for international co-operation through general funding, diminishing the need to apply for specific bilateral programmes.

Bottom-up approach, responsive mode funding, support of excellent research are the key criteria for majority of Academies. Top-down approach is used in some cases to advance collaboration in specific fields (the Royal Society emphasises capacity building in its international policy work; National Academy of Sciences of Belarus runs a number of thematic collaboration programmes) and with specific regions (CEE in the 1990s; emerging regions nowadays). P. Drenth has commented on targeted assistance (aid and support aiming at improving scientific potential of a region) growing into real collaboration between partners to their mutual benefit in the longer run.⁸

However, isn't the selection of administrative and funding tools a priority-setting in itself (joint projects over individual visits, bilateral symposia over bilateral exchanges, PhD status over that of doctoral students – or *vice versa*)? Or the selection of cooperation partners? One might argue that concluding of agreements gives a priority to the certain region over the region with no partner. The larger Academies strive to incorporate Academies worldwide into their partnership lists; the smaller Academies look for certain partners to team up with, in order to reach the critical mass necessary for excellent research.

In contemporary diversity of multilateral cooperation tools, bilateral cooperation may often retain its specific attraction, though. Bilateral agreements provide a framework of help for establishing or renewing contacts, facilitating future long-term work in the new country, or providing seed money for wider cooperation, for building multilateral consortia for successful participation in EU programmes. In some countries, the existence of an agreement may trigger a governmental budget allocation otherwise not available, Bilateral exchanges are a cost-

⁸ P. J. D. Drenth, European Scientific Collaboration: The Role of ALLEA. In: ALLEA Annual Report 2003, 9-16.

sharing mechanism - helping to release joint funding they reduce the demand on national funding. In some cases scientific exchange programmes are definitely a channel for foreign researchers they might otherwise not have and in a sense; act as a means against the brain drain, enabling those researchers to train and work temporarily in excellent laboratories without a need to leave home country permanently. Bilateral joint projects usually prove a good use of funding whenever operated. Academies hold the procedures of participation in the bilateral cooperation schemes comparatively simple and quick; the management is usually flexible. Implementation of bilateral agreements facilitates contact-keeping and information-sharing, enhancing joining forces for common activities and strategies in a wider European context.

Enhancing mobility through the exchange schemes between Academies has also a very important added value: it means enhancing the visibility of Academies both in a host country and outside the country.

Final remarks

In summary, the cooperation between Academies is closely related to other important elements of their activities: frontier research and national heritage, intellectual property rights, ethics, efficiency of research funding, etc. A challenge to the ALLEA in the future is to find a good balance between unity (Europe as a 'melting pot') and diversity (richness of languages and cultures). Whatever the activities were, the associated voice of Academies is stronger under auspices of ALLEA.

Web sites of the ALLEA member Academies and responses to inquiries sent out to the cooperation partners of the Estonian Academy of Sciences have been used as a source for this brief survey. Estonian Academy of Sciences thanks all partners who kindly agreed to share their data, experiences and ideas. Referring to E. Sylvester Vizi, Hungarian Academy of Sciences: "... science is cooperative endeavour, where cooperation is not an option, it is a must".⁹ All the more reason to encourage Academies to expose their international activities at their web pages.

⁹ E. S. Vizi, Farewell Address at the World Science Forum, Budapest, 2005.