Policy recommendations for enhancing Science and Technology cooperation between the European Union and Southeast Asia

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Executive Summary: Policy Recommendations for enhanced S&T cooperation between the EU and SEA

Eleven policy recommendations have been developed to maximise the opportunities for Europe Southeast Asia collaboration within international funding programmes.

1. An enhanced EU-ASEAN dialogue on S&T between political decision makers should develop common strategic priorities. Collaborative R&D should be funded in these priority areas by international programmes between Europe and South East Asia.

2. Mechanisms for feedback and input from South East Asian and European stakeholders (including the scientific community) should be implemented both in priority setting decisions and the development of programme procedures for international collaborative research programmes at every stage of the decision-making process.

3. Framework programmes should include substantial dedicated funding calls targeted at scientific collaboration with the South East Asian region. Joint calls should further be developed bi-regionally.

4. Programme rules should be simple, stable, consistently applied and well communicated, as well as adaptable and able to tolerate risks inherent to scientific endeavours. Rules should be based on common standards and encourage equal project participation and leadership.

5. Information on potential partners for Europe – South East Asia collaboration should be easily accessible to all, and regular networking and relationship building activities should strengthen relationships between researchers in Europe and South East Asia.

6. International programmes should support the development of strong national research infrastructures within the Southeast Asian countries by establishing inter-regional centres of research excellence and assisting in the development of a strong base of human research capital.

7. Inter-regional mobility should be enhanced through the development of instruments and removal of barriers, resulting in an equal exchange of European and Southeast Asian researchers between both regions.

8. Funding programmes for the Southeast Asian region should include science for international development components, where required.

9. Programme mechanisms should be cultivated to capitalise on the innovative elements of projects and ensure engagement of the private sector. Mechanisms should, additionally, consider the potential benefits to the economy and the society.

10. Easily accessible information on FP7 and the opportunities it provides for South East Asian researchers should be broadly disseminated within South East Asia, especially using the network of National Contact Points.

11. Sufficient time between the release of calls for proposals and the deadline for submission of proposals must enable potential projects to identify partners, form consortia, and draft successful project proposals.

Introduction

Recommendations have been developed to enhance S&T cooperation between Southeast Asia and the EU through effective international funding programmes.

Three different methodological approaches, involving input from Southeast Asian and European stakeholders, have resulted in a set of key policy recommendations to optimise S&T cooperation in the short and long-term. These key recommendations are presented on the previous page.

The rationale for international collaboration, and especially the specific benefits to be gained from enhancing Europe-Southeast Asian S&T cooperation are outlined in the first section of the paper. The second section offers an analysis of the opportunities and pitfalls of bi-regional S&T collaboration, as assessed by experts from Europe and Southeast Asia, using a modified SWOT methodology. The third section derives recommendations from a long term region-to-region perspective on S&T cooperation, applying a scenario and backcasting based foresight approach.

These recommendations arose from analytical work carried out by the SEA-EU-NET [1] project and reflect the current state of research. Expanded analytical study will be continued in 2010, including high-level consultations with S&T decision makers, foresight workshops on the country perspectives of bi-regional S&T cooperation and a Delphi analysis of the researchers' view.

The recommendations do not represent the official view of any individual government and have been compiled by the project SEA-EU-NET.

We would like to thank all the SEA-EU-NET partners that have participated in the compilation of this paper, and all the contributing experts for their time and efforts.

[1] SEA-EU-NET is co-funded under the 7th Framework Programme for RTD under the Capacities Programme – International Cooperation. Project duration is 48 months: January 2008 till December 2011. Grant agreement no.: 212334

1. Section: Signpost to success

Compiled by Jessica Wright on behalf of SEA-EU-NET

1.1 The rise of and global importance of international collaboration

The world today is faced with global issues. Science has long since overrun national borders to find global solutions to these global issues, which are faced by every national government. Solutions are required to address climate change, energy security, epidemics, food safety and security. Neither individual institutions nor national governments have sufficient resources to engage in the R&D to address any one of these issues, let alone all of them. Thus, for both scientific and economic reasons, there is a trend towards increased international collaboration,[2] which has been facilitated by the rise of instant communication, international travel and international funding programmes for collaborative research.

Ease of communication is widely recognised as key to the development and success of co-operation. We now live in an age where we can access vast quantities of information from all around the world and interact with a diverse range of people.[3] Researchers no longer need to be in the same place at the same time. Increasingly available information has also augmented the role of science in the lives of citizens has also been increasingly recognised, generating a public demand for scientific solutions to address global issues. As government awareness and public demand for 'global science' has increased, so has the availability of funding for international co-operation through international collaborative research and development funding programmes.

The value of international collaboration and resultant need for international funding programmes for research and development is undeniable. The value of international collaboration and resultant need for international funding programmes for research and development is undeniable. Collaboration is vital to the rapid advancement of research and development, and as aforementioned, to tackle global issues. Research and development cannot and will not advance as quickly without collaboration. It is further necessary to enable researchers to gain access to a wide range of resources (human, research facilities, funding, data and samples). Collaboration results in mutual benefit for individuals, organisations, societies and national states.

An additional benefit of increased cross border co-operation is the role of collaboration in international development. Science and innovation are intricately linked to development and vital to enable developing countries to move up the value chain. People who live in the developed world often forget the role science has had in transforming their lives. However, in the process of mapping out development plans for emerging nations, many industrialised countries have recognised the role that science and innovation have played in their own development.[4] Life changing scientific

2 GSIF: a Strategy for International engagement in research and development, page 12

3 GSIF: a Strategy for International engagement in research and development, page 3

4 Calestous Juma in Conway and Waage, Science & Innovation for Development, page xiv and Solow, R., (1957) "Technical Change and the Aggregate

developments to date include vaccinations, penicillin, high yield agriculture, electricity, silicon chips to name but a few… Scientific developments often go beyond their primary outcomes and scientific advances often spur economic growth.[5]

The challenges faced by developing countries cannot be addressed without scientific and technological solutions.[6] Scientific knowledge and technology generated by and shared through, collaborations can be applied to specific development challenges and further, assist in the achievement of the Millennium Development Goals. Scientific knowledge provides countries with the tools to develop, enjoy economic growth and improve the lives of their citizens. Thus, international funding programmes have an opportunity to assist in the development of poorer countries, as well as engage in scientific excellence.

International collaboration is not a new phenomenon. International collaboration has always been an integral part of scientific activity.[7] However, the raised profile of global issues, increased ease of communication and rise of international funding programmes has increased the incidence of co-operation. Moreover, many projects thrive on international collaboration. Collaboration is also essential for the advancement of individual researchers' careers and to enable researchers to become international leaders. The increased participation in international collaboration is visible in the increase in the number of international co-publications as a total of all publications, evidenced below over the 11 year period from 1992 to 2003.

	UK	France	Germany
1992	20.5	27.1	25.1
1995	24.0	30.1	29.0
1998	31.3	35.8	41.7
2001	35.8	40.9	46.2
2003	39.2	43.7	43.0

Table 1: Share of international co-publications of total publications

1.2 The nature of international collaboration results in an infinite number of forms

All international collaborations are uniquely different.[8] There are a multiplicity of different situations in which collaborations can arise between different countries and in different research disciplines.[9] Resultantly, international collaborations exist in a variety of forms. The OECD provides the following examples of the different forms of collaborative projects: [10]

⇒ "Research collaborations between individual scientists. These can be relatively informal, for example by exchange of letter, with little or no exchange of funds.

⇒ Similar, but bigger, agreements between research institutions. Usually a more

Production Function," The Review of Economics and Statistics, 39, 3, pages 312-320 : "In a seminal paper published in 1957, Nobel laureate Robert Solow showed that the previous 40 years technical change had contributed more than 87% of gross output per person while the increase in capital investment explained only about 12%."

5 Wagner, The New Invisible College: Science for Development, page 1

6 Conway and Waage, Science and Innovation for Development, UKCDS, page 7

7 INCO-Net MIRA Workshop on scientific co-operation & impact measures intro paper, page 2

8 OECD Global Science Forum, Study on International Scientific Co-operation, Report on workshop on Best Practices in International Scientific Co-operation, page 2

9 INCO-Net MIRA Workshop on scientific co-operation & impact measures intro paper, page 2

10 OECD Global Science Forum, Study on International Scientific Co-operation, Report on workshop on Best Practices in International Scientific Co-operation, page 2

formal approach is required, particularly if funding for the participants comes ultimately from government itself, or from associated agencies.

⇒ Collaborations requiring significant injection of capital or operational funding. Even if funds do not cross national boundaries, a more formal approach is usually inevitable, with correspondingly more complex arrangements. Such collaborations can be based on an existing facility or facilities, or may require the establishment of a new structure. Collaborations designed to provide a new capital facility, for example a facility that would not be within the capability of a single partner country."

International projects also have a range of outcomes, which will have varying degrees of impact. An outcome may be as simple as achieving a project objective or as far reaching as providing a solution to an issue which will benefit society as a whole.

Programmes need to take account of the variety of circumstances in which projects exist, including national and cultural considerations. South East Asia is a very diverse region and although it shares certain similarities with Europe (E.g. similar population size), is the regions are predominantly distinct in characteristics.. These bioregional differences must be acknowledged and addressed in international funding programmes.

1.3 Opportunities in Southeast Asia

There is no shortage of common challenges facing South East Asia and Europe: climate change, food security, epidemics etc. These global challenges, earlier remarked upon, require global solutions and can only be addressed through collaborative research. There are extensive opportunities for collaborative scientific research between Europe and South East Asia.

South East Asia is a highly populated region rich in natural resources and biodiversity, with pockets of scientific excellence, presenting a varied array of research opportunities. South East Asia is also scientifically important because of the challenges it faces, especially with an increasingly urbanised population. Like Europe, South East Asia faces water and food security challenges. South East Asia is one of the world's hotspots for the emergence of new infections and drug resistance. For example, in 2009, the first malaria parasites resistant to the life-saving drug artemisinin were discovered in Cambodia, which the WHO predicts "could seriously undermine the success of the global malaria control efforts."

Although the countries of South East Asia experience similar geographical, ecological and climatic conditions, there is a large disparity between the national development and research and development capacities of each country,. Taking gross national income (GNI) per capita (Atlas method) as the strongest indicator of international competitiveness, representing a country's ability 'to earn income,' the countries of South East Asia are divided across four income brackets: high income, upper middle, lower middle and low income. (See table 2 below:) The majority of the states of South

East Asian countries are developing countries, and categorised by the World Bank as lower-middle income to low income countries (please refer below). However, the pace of development in most of states is extremely rapid and South East Asia is forecasted to comprise of the next generation of scientifically proficient middle income countries. Furthermore, South East Asia is regarded as a rising economic power house. Engaging in collaboration with South East Asia now will develop important future ties with this emerging economy of global importance.

High income countries (GNI US$39,345 – US$ 7,878)**	Upper-middle income countries (GNI US$7,878 – US$3,260)*	Lower middle income countries (GNI US$3,260 – US$2,078)*	Low income countries (GNI US$2,078 – US$524)*
Singapore (US$34,760)	Malaysia (US$6,970)	Thailand (US$2,840)	Philippines (US$1,890)
Brunei (US$26,740)		Indonesia (US$2,010)	Vietnam (US$890)
			Laos (US$740)
			Cambodia (US$600)
			Myanmar (estimated to be low income)

Table 2: Gross National Income per capita (atlas method) for countries of South East Asia11

The current disparities in wealth in South East Asia are generally mirrored by equal disparities in science and technology capacity. Singapore, which enjoys the highest GNI per capita, has a strong science and technology (S&T) base with world class research facilities and further pursues strong S&T policies, including a human capital policy to build up a supply of national research talent and attract the best researchers globally to Singapore.[12] Singapore has a high gross expenditure on research and development (GERD) and is on track to meet its target of a GERD of 3% of total GDP by 2010 (over 70% coming from the private sector). In contrast, and as an exception to the general trend of higher GDP accompanied by developed S&T base, Brunei's high GNI per capita does not correlate to a strongly developed S&T infrastructure or an equally high ratio of GERD to GDP. Brunei's GERD is less than 0.1% of GDP.[13] With the exception of Brunei, rapid economic development in the region has been accompanied by rapid S&T development. Thailand and Malaysia's R&D intensity has more than doubled between 1996 and 2007.[14] In 2009, Thailand had a GERD of 0.26% of GDP[15] and Malaysia 0.69%.[16] Vietnam has a GERD of 0.45% in 2010[17] and Indonesia and the Philippines have GERDs of less than 0.1% of GDP.[18]

Researchers in the developing countries of South East Asia experience difficulties as a result of the weaker S&T infrastructures, such as poor remuneration of researchers and simply, lack of resources. In Cambodia, a government researcher's salary does not cover basic expenses.[19] Basic incoming salary is not as large a problem in the Philippines or Malaysia, but many still avoid research careers because they do not pay as well as

* World Bank GNI per capita (atlas method) world average figures

11 World Development Indicators database, World Bank, 7 October 2009

12 Refer to Singapore's Ministry of Trade and Industry, Science and Technology Plan 2010

13 UNESCO Institute for Statistics, September 2009

14 ibid.

15 ibid.

16 APEC, http://www.apec-isti.org/IST/abridge/rep/my_rep.pdf

17 Ministry of Science and Technology, Vietnam, 2010

18 UNESCO Institute for Statistics, September 2009

19 Quote by Chan Roath, Director of Research in Ministry of Education, Cambodia in 'Life as a Scientist in South East Asia" by Shiow Chin Tan published on Science and Development Network website: http://www.scidev.net

other sectors.[20] Salaries are not the only problem in these countries. In Cambodia, there is such an acute lack of science resources that the Royal University of Phnom Penh only teaches science theory.[21]

Another problem, most notably suffered by the Philippines, is "brain drain." The global research workforce has become increasingly mobile (a phenomenon known as "brain circulation") over the last decade. "Circulation" as a concept could benefit the development of weaker national S&T bases as knowledge and ideas circulate with the movement of people.
However, in reality, "circulation" follows a pattern of net flow from geographical regions with weaker science systems to those with stronger science systems, and thus is detrimental to developing states. Researchers flow to areas where they can maximise access to resources and best utilise their talents.[22] This pattern is observed between South East Asia and the EU, where there is a net flow of researchers from Asia to the EU (Please refer below). To fully develop a strong S&T base, the developing countries of South East Asia need to address this issue and build up a strong local research workforce (E.g. Singapore has a strong human capital policy focusing on attracting the best global talent to Singapore and developing the best home grown talent).[23]

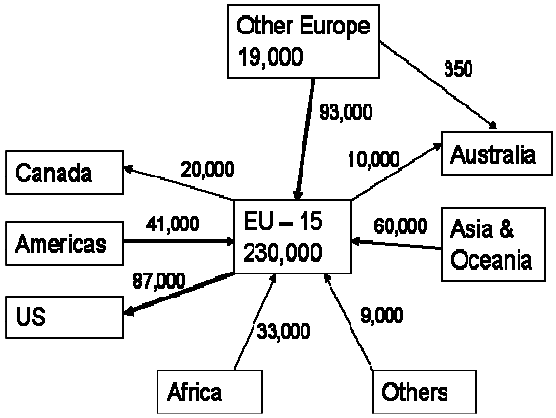


Figure 1: Net migration between world regions to EU-15: origin of non-nationals occupied in S&T, 2000[24]

As observed, much of South East Asia is still developing but it is developing at a rapid pace and more and greater pockets of scientific excellence are evolving. SEA researchers are participating in more international collaborations and international R&D programmes.

Researchers from South East Asia have actively participated in the EC's Framework Programmes. There has been an increase in South East Asian participation in the European framework programmes from FP6 to FP7. During the 6 years of FP6 a total of 149 SEA partners from SEA participated, receiving €16.4 million EC contribution. In the first 2 years of FP7 a total of 115 SEA partners participated, receiving €14 million EC contribution. The success rate of projects with South East Asian partners in FP7 is 30%, which is above the average success rate which ranged between 10-25%, depending on the thematic area. The success rate of projects with SEA partners is above average for projects within the thematic areas of Health, Food/Biotech, Research Infrastructures, Science in Society and Transport thematic areas. However, the success rate of projects is below the average in other thematic areas, notably

20 'Life as a Scientist in South East Asia" by Shiow Chin Tan published on Science and Development Network website: http://www.scidev.net
21 'Life as a Scientist in South East Asia" by Shiow Chin Tan published on Science and Development Network website: http://www.scidev.net
22 Wagner, The New Invisible College: Science for Development, page 4
23 Refer Singapore's Ministry of Trade and Industry, Science and Technology Plan 2010
24 GSIF: a Strategy for International engagement in research and development, page 14

Environment, ICT and Social Sciences/Humanities. The success of projects in specific thematic areas could be explained by the high relevance of the thematic areas for SEA..[25]

There is a strong foundation of SEA participation in the European framework programmes in the South East Asian region. It is important to build upon current participation and secure further collaboration with this important region, both in the long and short term. . Scientific excellence is increasing and the region, creating opportunities for Europe Southeast Asia 'best with best' collaboration. In addition, there are significant opportunities for the EU to assist in the development of national S&T bases in the region, cementing strong relationships and creating future opportunities for collaboration.

1.4 Concluding comments

European researchers must engage in international collaborations to be international leaders. If European researchers are at the forefront of international research, Europe will continue to be one of the most dynamic and competitive knowledge based economies in the world.[26] The European Framework programmes have provided, and must continue to provide, an invaluable mechanism to establish and fund collaborative research between the member and associated member states of the EU and the countries of South East Asia.

South East Asia is an important research partner for Europe in the drive to find scientific solutions to global issues such as food safety and security, energy security, climate change and the control of epidemics. Scientific excellence is rapidly rising in the region and South East Asia also has a very unique biodiversity and is a hot spot for the emergence of infectious diseases (e.g. outbreak of highly pathogenic H5N1 avian influenza originated in South East Asian in mid-2003). The ongoing and increasing importance of the South East Asian region generates a need for programmes to facilitate cross-border collaborative research with this region. In this regard, it is important that the European Commission's framework programmes encourage collaboration with this important region. As noted above, researchers from South East Asia have successfully engaged in the Framework Programmes but there is a greater potential for participation, which must be realised.

Certain characteristics of international scientific programmes for collaborative research with multi-country participation (e.g. the EC's Framework Programmes) have more complex requirements than participating in bilateral programmes. This is caused by an extra level of legal and financial frameworks in addition to national rules. However, other elements of such programmes can create a more conducive environment for collaboration. Framework programmes have one overriding funding pot, which can remove hurdles faced when entering into a joint research project. There is no requirement for intergovernmental agreements to be entered into before a project within a Framework Programme is commenced, which might otherwise be required when entering into a large scale joint research activity.

[25] cf. http://cordis.europa.eu/home_en.html

26 EUROHORCs, European Heads of Research Councils, EU Regulatory Framework for Research Actions, Basic Principles for Robust Rules, page 1

International funding programmes must have the necessary characteristics to enable the programme to be attractive and easy to participate within. They must have simple but clear regulations, and flexible but precise financial policies. All programmes need the flexibility to promote creativity and allow scientists the liberty to engage in high risk research with the potential for large gains, whilst simultaneously ensuring funds can be traced and misuse guarded against. It is important that international programmes are conducive to research, offering the most attractive framework for collaborative research. SEA-EU-NET has prepared a list of policy recommendations to guide the development of future Framework Programmes and other funding programmes for international collaborative R&D, and create the best environment for collaborative research between Europe and South East Asia.

In addition to the policy recommendations for the development of successful programmes for research, SEA-EU-NET has developed a set of best practice guidelines for developing and participating in international projects). Lessons learnt from the development, participation and evaluation of international projects are rarely shared, resulting in an unnecessary waste of resource and repetition of effort.[27] It is generally deemed undesirable to have a prescriptive list of best practice guidelines for researchers establishing international projects, especially because there is such a diverse range of international projects. However, it is possible to identify common successes and issues which are shared by most projects. These common factors form the basis of a list of best practice recommendations which can be utilised by researchers wishing to establish international projects and optimise the potential outcomes. Best practice guidelines are in Annex 2.

1.5 Outlook

Expanded analytical study of existing materials on international collaboration and indicators of successful S&T collaboration will be conducted. Analysis will be substantiated by input from broad range of programme and project owners and policymakers from both Europe and South East Asia and more broadly, across the globe. Input will be sought from programme owners and participants globally by structured emails and telephone interviews. Conclusion of analysis will be broadly construed including input beyond EU – South East Asia collaboration but carefully applied to the context of bi-regional collaboration between these two regions. Workshops with EU and SEA programme owners and participants will be conducted to evaluate the success of programmes in the EU – South East Asia context.

27 OECD Global Science Forum, Study on International Scientific Co-operation, Report on workshop on Best Practices in International Scientific Co-operation, page 2

Section 2: Opportunities, Pitfalls, and recommendations for S&T cooperation

Compiled by Rudie Trienes, Jack Spaapen and Jacco van den Heuvel on behalf of SEA-EU-NET

2.1 Introduction – Major Opportunities and pitfalls

This report by the FP7 International Coordination Network SEA-EU-NET[28] presents an analysis of the opportunities and pitfalls with regard to S&T cooperation as assessed by experts from SEA and Europe, and it advises on a number of policy changes in order to further enhance scientific cooperation. The report is based on an analysis of information obtained in a number of activities and events that have been organised especially for this analysis. These include workshops and focus groups, semi-structured individual and group interviews with researchers and policy advisors both in Southeast Asia and Europe, and a number of dedicated feedback sessions at the SEA-EU-NET conference in Bogor, Indonesia, in 2009.

The major conclusion of both workshops, interview and feedback sessions is that by far the most important priority in developing S&T cooperative relationship between SEA and Europe is building a more sustainable soft and hard S&T infrastructure for research and development. In this, the prime focus should be on creating or enhancing strong knowledge hubs that have both a stimulating effect on the wider environment (other parts of the research system and society at large), and form an attractive place for young talented students and researchers. A good infrastructure is of pivotal importance in redressing the imbalance between researchers from SEA going to Europe and European researchers currently not going to SEA. A good research infrastructure and ample training opportunities would create a strong base of national researchers in SEA. It would also assist in shifting the focus of research cooperation from gathering samples and conducting field and laboratory work to establishing more continuous and sustainable R&D networks that consider the potential benefits to the economy and society of both regions.

At meetings between SEA and Europe at the highest political a more strategic SEA-EU dialogue should be cultivated to identify strategic interests for SEA-EU collaborative R&D projects, to take priority setting decisions for collaborative research programmes, and to engage all partners and stakeholders in the planning and design of funding calls targeted at the collaboration with SEA.

Cooperation in science and technology (S&T) between Southeast Asia (SEA) and Europe is beneficial to both regions, provided attention is paid from the start to the differences in major interests on both sides, both of researchers as well as policy makers. This is not easy, given the differences between both regions with regard to the level of investment in S&T, the level of development of research infrastructures and the differences in needs on both sides as a result of this. From a more positive perspective, however, there are not only differences between these two regions, but substantive common features as well. Both regions are of similar size in terms

[28] See Appendix 1 for more information on the SEA EU NET project

of number of inhabitants, have long historical relationships (which are still visible in parts of the S&T systems) and are, despite internal diversity, trying to develop a common regional policy (through the political bodies of ASEAN and EU).

In other words, both regions are thoroughly familiar with each other, and are able to understand the difficulties in developing a common policy, despite the differences between their various nations. A major force behind the growing urge towards a more integrated policy across individual countries is arguably the rise of global problems, such as climate change, energy related issues, and infectious diseases.

There are many examples of fruitful scientific collaborations and linkages between researchers in Europe and Southeast Asia (SEA). Such partnerships are beneficial to all parties involved, and the resulting advancements in research delivers improved quality of living, life saving medicines and economic returns to both regions.

Bilateral cooperation between countries from both regions has been important for centuries. After the lopsided relationship in colonial times, a more balanced relationship has been slowly developing over the last decades. Differences in the field of S&T between Europe and SEA are also diminishing: emerging economies of Southeast Asia are catching up, and budgets for education and research are steadily rising.

Opinions on how to establish long-term and sustainable R&D networks between SEA and Europe vary, but a limited number of issues stood out in discussions with experts of both regions. Whenever setting up international cooperative projects or programs, serious attention should be paid to the following major opportunities and pitfalls.

Major Opportunities

1. The balance between research interests of both regions, a win-win situation, co-writing proposals, co-publications, co-patenting (all still biased towards Europe);
2. The importance of including attractive arrangements for young talented researchers (brain drain-brain gain issues);
3. The different policy agendas and interests with regard to establishing research infrastructure (there are still huge differences in the region, there's no one size fits all approach);
4. The options for more mutual learning in the region and North - South - South cooperation.

Major pitfalls

1. The lack of clarity on what EU programmes entail, on criteria for application, on potential partners;
2. The absence of special EU policy and funding for SEA;
3. The difficulty of attuning the interest of researchers on both sides (the balance between basic research and application; long term capacity building, connecting to the international scientific community);
4. The lack of mutual learning, in particular from good practices (like e.g. institutes for good governance in Thailand, new research institutes in Vietnam, joint research labs in Taiwan).

2.2 SWOT analysis of SEA – Europe cooperation: why and how

SEA-EU-NET has performed an analysis to identify the best opportunities and potential pitfalls for scientific cooperation between SEA and Europe. We have used a methodology that is based on the well known instrument of SWOT analysis (Strengths, Weaknesses, Opportunities, Threats). However, for reasons explained below, we have not conducted a full SWOT analysis, but we have focused instead on identifying only the best opportunities for cooperation and the potential pitfalls.

A limited SWOT Analysis: Aims and Basic Methodology

Originally, the SWOT analysis was developed in the business community, with the purpose of discussing the strategic options for future development of business enterprises. Later, the approach was picked up by academia (Harvard business school among others) and over the years it has become increasingly more common in the research world. The main pre-condition for a SWOT analysis is the availability of robust data about the entity that you want to research. In the case of SEA-Europe cooperation there is no clearly defined entity, such as a research program, or a number of institutes that cooperate. The focal point of SEA-EU-NET is to stimulate bi-regional S&T cooperation between countries in South East Asia and Europe. These entities are too wide and diverse to collect the necessary data in the limited scope of this study.

Therefore, we have decided to conduct a more restricted analysis by compressing the SWOT analysis. First, we put strengths and opportunities together in a single category and weaknesses and threats in another. We refer the first category as Best Opportunities and to the second as Potential Pitfalls. Secondly, since we cannot use all available data (in principle all data produced by S&T cooperation projects between the regions Europe and SEA), we have limited ourselves to (1) some overall statistical data regarding collaborations between Europe and SEA as they are available in the FP6 and FP7 programs and (2) expert information of people who have knowledge of S&T cooperation in the context of SEA and Europe.

For the latter type of information, we have used focus groups and interviews as main instruments. We did so both in SEA and in European environments. To gather data from the SEA context, we used the ASEAN Committee on Science and Technology (COST) conference that was held in Bali in May 2009. For the European context we organised a workshop in Amsterdam on 21 September. In November 2009 we presented a draft version during the Week of Cooperation in Bogor, and conducted a number of dedicated feedback-sessions.

Some details of the overall approach: The aim of our analysis is to combine information from a wide variety of sources, both from the SEA and the European perspective, and from policy makers and researchers. Furthermore, we use a wide range of cooperation experiences, in terms of scientific field, country, and cooperative arrangement. In the meetings in Bali and Amsterdam we used a similar approach, i.e. a combination of interviews and focus groups, but with a difference: During the Bali meeting we used two separate groups of informants: experts that we had invited to participate in the focus groups, and other experts that were participating in the ASEAN COST conference and were

available for individual interviews. In Amsterdam, where there was no larger conference, we interviewed the participants that we invited for the focus groups at a separate moment individually. The experts that participated in the focus groups in Bali were mostly members (sometimes chair) of subcommittees on specific scientific fields of the ASEAN COST. For the interviews we selected participants of the conference, paying due attention to the distribution over fields and countries. The experts in the Amsterdam meeting came from different European countries. They were either suggested by SEA-EU-NET partners, or identified through the FP6 and FP7 databases, and in a few cases through the network of the Royal Netherlands Academy of Arts and Sciences (KNAW).

For the interviews we used a semi structured questionnaire of which we had two versions, adapted to researchers and to policy makers.

The focus group approach was as follows: We divided the participants into groups of six to eight people and let them discuss six topics. The topics were loosely related to the questionnaires. It was emphasized in advance that the goal of a focus group is not to reach consensus, but to exchange information and experiences and open up perspectives. That is why the group has to be relatively small, and yet diverse enough to entail a variety of fruitful perspectives. After the discussion in the focus groups, participants came together for a plenary session in which the main results were discussed and common grounds were explored. This resulted in a list with opportunities and pitfalls. After the Amsterdam workshop, the results of both meetings were brought together and a draft list was presented to the Bogor conference in November 2009. During this conference separate, dedicated feedback sessions were organised during break-out sessions, and the comments of the conference participants were taken up in the final text.

From the desk study that we performed in the first phase of our study we selected the six main topics that we used as a base for both the interviews and the focus groups:

1. Benefits of growing international S&T cooperation for local research

2. Benefits of growing international S&T cooperation for the wider society

3. Pros and cons of SEA-Europe or other international cooperation

4. Government policies to stimulate SEA-Europe S&T cooperation

5. Interaction between public and private research

6. Pros and cons of funding policies in both regions

While the six topics all represent the interface between science and politics, between research endeavours and policy intentions and measures, the first three are slightly slanted towards the side of S&T, the latter three to the policy side. By discussing these issues with experts from both regions, we were able to shed some light on the following topics in the next chapters of this report:

- Existing and emerging opportunities for international cooperation
- Potential pitfalls
- Challenges for regional, national and supranational policies
- International S&T cooperation : with Europe and other parts of the world

2.3 Existing and emerging opportunities for international cooperation

Introduction

Researchers everywhere in the world try to connect with their colleagues internationally, in order to share new scientific knowledge, exchange research methods, start up joint projects, and thus improve the quality and dissemination of their work. At the same time, policy makers focus on achieving a wide variety of societal goals, in order to improve living conditions for the general population, by advancements in sectors such as education, health, and infrastructure. In this, the objectives of science and government policy at times overlap, but at other times deviate to some extent. In general, the relation between science and society, and the differences in goals and interests between both communities, has received a lot of attention all over the world from policy makers and scientists alike. A main reason for this can be found in the growing awareness of the urgency of a number of global problems, such as changing climate, energy issues, water management, and health matters. Growing global competition between countries and regions also forces governments to expect more help from science to address societal problems.

When we compare research policies in Europe and Southeast Asia, we see differences and similarities. While in most European countries policy makers try to find a balance between the support for excellent fundamental research and for research relevant for societal goals, the accent seems to be on the former. In most Southeast Asian countries, the necessity for research and international research collaboration to focus on societal problems seems to be self evident, given the wide array of challenges in these countries, calling for applications of new knowledge.[29] This is clearly the case in areas that regard the use of natural resources, sustainable environment, disaster mitigation, more efficient agriculture, or health. But while these areas imply a prime focus on application orientated research, the development of a solid base for more fundamental research is felt necessary too. Here we have to keep in mind that, even within individual research institutes, a clear line between "applied" and "fundamental" research is often difficult to draw.

When looking for opportunities for R&D cooperation between Europe and SEA, both drivers for innovation should be equally addressed, that is a match should be sought between what motivates researchers in international collaboration, and the needs of the region or the society at large. This is a fundamental issue, which need to be dealt with properly from the very beginning when looking for good opportunities to collaborate in international programmes. This is of course not to say that bottom up collaborations between researchers of different countries or regions that focus on basic research should be discouraged. However, for improved collaboration at a bi-regional level, as a rule based on large funding schemes, the societal relevance is a point that needs more attention. When discussing existing and emerging opportunities for cooperation we refer on the one hand to positive experiences with present schemes and on the other to opportunities that open up thanks to

[29] For a short discussion of theoretical concepts concerning international S&T cooperation, see Schueller et al., International Science and Technology Cooperation policies of Southeast Asian Countries. Consultation prepared for the EU Commission on the occasion of the first bi-regional science and technology policy dialogue, EU-ASEAN (2008), 4-6.

changing circumstances. While trying to develop successful new initiatives, it is useful to consider what already works and what we can learn from this. In the next subchapters we use the results of discussing the six topics mentioned in chapter two with our respondents, focussing on benefits and challenges of international cooperation.

Benefits of and challenges to international R&D cooperation

From the point of European researchers, one of the major benefits of collaboration with Southeast Asia is the availability of samples, due to the vast natural resources. As such this provides experimental fields for a wide variety of research themes. But European research institutes also see benefits for enhancing capacities of researchers in their own organisation by cooperating with SEA partners.

From the point of view of SEA researchers, the motivation for collaboration is likely to be different. For them, access to international funding schemes is important given the low level of investment in SEA countries (except Singapore and arguably Malaysia), and the possibility to co-author articles in high ranking journals. International cooperation is often seen as a way to stimulate the number of international publications of an institute, in order to improve the institute's reputation. Other motives can be options for co-patenting, joint use of new instruments, exchange of students and new research facilities.

The rationale for international research cooperation within Southeast Asia might also differ from country to country, for example with regard to the relative weight that is put on issues such as physical research infrastructure, access to international publications, general scientific and technical knowledge sharing.[30] These differences should be taken into consideration when setting up international collaborations. It requires a level of awareness by policy makers on both sides. Examples from our SWOT analysis show that in Vietnam for instance, both capacity building and access to technology and facilities are among the prime motivations for cooperation, while in Indonesia there is more focus on knowledge sharing and access to international publications. These differences become apparent when looking at concrete examples of collaborations. In Vietnam therefore, the focus is much more on building new institutes and reorganizing the higher education sector, while in Indonesia the focus is more on joint endeavours between researchers and research institutions.

But there are also issues that are important for all countries alike. Clearly, the training of young researchers, as a specific form of knowledge transfer, is one of the main motives for international cooperation in most countries. Though there is always the danger of brain drain, in most Southeast Asian countries it seems to be the case that a large majority of students return to their home countries. This focus on capacities of young researchers makes it both worthwhile and necessary to invest in international research networks with a long term perspective. On the other hand, there is another danger when looking at the benefits for the academic sector: it is often difficult to keep excellent students in the academic part of the R&D system, as many prefer working in the commercial sector. Mobility of researchers however, can be seen as an indicator of both quality and relevance of

[30] Schueller et al., International Science and Technology Cooperation policies of Southeast Asian Countries.

the institute that 'produces' these researchers. The influence of international cooperation regarding this point is felt to be important by researchers and policy makers alike.

In several countries, policy makers and researchers also hope for positive influence of cooperation on the general level of research and teaching at their universities. Sending (PhD) students abroad is an important aspect of this development strategy. Many SEA researchers would like to improve this mobility by making it more of a reciprocal process, that is, by also having more EU students going to SEA. This arguably would also enhance the European understanding of SEA research systems and provide more insight in opportunities and pitfalls for cooperation. For SEA institutes, more short term practical arguments also play a role in the need for cooperation: as a spinoff of joining an international network, they hope to gain experience in formulating proposals for future international funding.

At the policy level, for both regions, economic and social development are important motives for international S&T cooperation. Specifically, most SEA countries are trying to raise both the strength of their economies and the level of welfare of its citizens in order to be able to operate on a more equal level in relation to presently more developed countries. In order to work towards such a "knowledge equilibrium" international R&D cooperation is a necessity. More importantly, global issues (such as the climate change, sustainable energy, infectious diseases) can only be addressed by global cooperation. It is also clear, however, that countries in SEA face several specific challenges, the diminishing shrinking level of natural resources, or the vast impact of certain diseases such as aids or malaria. Because of this, many of the region's scientists and governments also see international collaboration as an important starting point to face these challenges.

Finally, the ratio between public and private investments in R&D is an important issue worldwide, but is perhaps somewhat more urgent in Southeast Asia, as many countries in this region have limited budgets for R&D (but some are rapidly catching up). In many countries there is also little private investment in R&D, as global companies tend to locate their R&D departments elsewhere, and many countries do not have a lot of medium or large sized companies with sizeable research facilities. In global comparison, the general state of the Southeast Asian research infrastructure is still weak (with exceptions). While it is clear that the public and private sector need to work together to form a successful innovation system, it seems also clear that the initiative for stimulating such cooperation in the R&D system needs to lie within the public sector. Singapore's Agency for Science, Technology and Research (A*STAR) is often mentioned as an interesting example within SEA.[31] The EU framework programmes in principle form a good opportunity for such development since they are very open to public-private collaboration, especially for small and medium enterprises (SMEs). However, in many SEA countries, where private R&D is limited, an extra effort from EU and/or ASEAN seems to be needed to actually reach and attract companies.

A specific point of attention in this respect is the available level of expertise within a country, also tied to brain drain issues. Indonesia has difficulties in setting up

[31] For more information, see http://www.a-star.edu.sg/a_star/2-About-A-STAR.

cooperation between private organisations and public research institutes, because of a lack of experts for example in nanotechnology. Excellent researchers, both in publicly and privately funded research, tend to leave the country. It is important to be aware of the fact that this problem exists as much for commercial R&D as it does for publicly financed research institutes.

Learning to find the best opportunities

Above we have described the major benefits and challenges as they were brought to the fore by our respondents. Here we reflect on some of the consequences for developing new collaborations. Obviously, the circumstances differ in the various SEA countries with regard to best opportunities for developing new cooperative arrangements. Efforts to improve cooperation between EU and SEA obviously have to be sensitive to these differences. This also requires good informed policy makers and civil servants on both sides. But it also requires the willingness to learn from each other. Below, we highlight by way of example some arrangements and policies in different countries that might provide lessons for other countries.

(1) Interactions between research, industry and government

A good innovation system only works when there are good connections between the different parts of the system: research, industry and government. Singapore, and to a somewhat lesser extent Malaysia, arguably have succeeded in building such connections. Malaysia has invested in private sector R&D development, in particular to make risks acceptable for local companies. This policy of the Malaysian government indeed encourages tripartite cooperation between government, industry and research institutes. It is worthwhile to see whether this model may be useful for other national governments and/or ASEAN.

(2) The next generation of researchers

Any S&T system can only be sustainable as long as it manages to renew itself on a permanent basis, in particular through educating and training a next generation of researchers. We see various policies in different countries. For example, Indonesia cooperates with China via programmes through which Indonesian students are funded to study in China. Indonesia also has some positive experiences with the so-called twin city approach, where on a local or regional level one SEA city or urban agglomeration connects to another in the EU. In such arrangements, several instruments can be included, for example exchange of students, cultural exchange, and cooperation with regard to environment related issues.

Arrangements like these might work for other countries too, especially when there is limited experience in international cooperation. Such small scale cooperation can lead to useful knowledge exchanges, and if successful can eventually create possibilities for larger networks.

Brain drain – brain gain issues obviously need attention too in the context of education and training. In the case of Vietnam for instance, explicit attention is paid to returning students from abroad to facilitate their reintegration in the national university system. Since this issue is important for all countries, it is worthwhile to assess whether or not these Vietnamese arrangements could work in other countries too.

(3) Pros and cons of old ties

Historically, strong ties existed between certain parts of Europe and countries in SEA, and these still to a large extent have a direct influence on cooperation. In Laos and Cambodia, for example, a substantial part of the international cooperation consists of bilateral links with France. While these ties are certainly beneficial, for example in the health sector, the Cambodian and Laotian governments also want to further integrate into the region, and develop their own strategic priorities, for example with a focus on cooperation in agriculture, fishery and forestry. Both governments could support each other in developing their own priorities, for example by focusing on human resource management. A huge demand exists for more accessible mobility schemes.

Wrap up

(1) Match different interests, learn from each other

The main conclusion of the above is arguably that while formulating topics for new research cooperation initiatives, there has to be a match between the interests of researchers in Europe and SEA.. But it is also important to be aware of promising opportunities in national or regional S&T policy and to learn from them. For example, when initiating a new cooperation and subsequently face by the issue of brain drain brain gain, one should look at those countries or policy measures that are successful in dealing with this specific challenge. Vietnam, for instance, seems relatively successful in reintegrating students that went abroad into the university system. What can be learned from this in other cases? Alternatively, the focus could be on the creation of long/term research centres where new knowledge can be developed, and by doing so offer an attractive environment for returning students and scholars. Good examples are the Asian Institute of Technology (AIT) which has its main campus in Thailand and the International Rice Research Institute (IRRI) with its main location in the Philippines.

(2) Create strongholds

The role of strong and recognisable research centres in Southeast Asia in stimulating interregional cooperation should be explored when setting up new initiatives, especially on themes that are directly relevant to the region, for instance on marine biology, coastal regions, fishery, forestry. Such centres arguably are attractive for foreign researchers, and thus can stimulate interaction with local researchers. The centres can thus also provide a stepping stone for European researchers into the region.

(3) Focus on problems that affect SEA

To cooperate especially on topics that affect both regions seems to be obvious, yet this is not always the leading principle. This is partly due to lack of attuning different interests in the research and policy systems. There is a need for a strong focus on international problems that hit the SEA region seems self evident. Climate change and CO2 emissions constitute global problems, as do energy related issues and the spread of contagious diseases. Successful cooperation depends largely on mutual benefits for partners from both sides.

(4) Involve policy makers from the outset

To create better opportunities for successful international collaboration, it is imperative to involve as early as possible policy makers and other relevant stakeholders. By doing so, projects can be better linked with national and EU interests. Emphasis should be put on sustainability of measures taken on basis of insights gained through the project. A lack of follow up after a limited project of three, four or five years is detrimental to building research capacity and jeopardizes long term perspectives on development of the region´s S&T systems.

2.4 Potential pitfalls

Introduction

In the previous chapter we discussed the opportunities that exist for international collaboration and the options to explore these, within the context of SEA and Europe. This chapter concentrates on potential pitfalls when setting up and maintaining international R&D cooperation between SEA and the EU. By "pitfalls" we refer, on the one hand, to pitfalls that despite being common and well known don't receive enough attention, and on the other hand to mainly practical issues that might hamper international cooperation, whether this takes place at the level of institutes or programmes, or at the level of individual researchers participating in international projects. Section 4.2 deals with some of the more common pitfalls that might occur in most of the cooperations set up by countries in SEA or Europe. Section 4.3, will go into more specific and practical examples, and to differences between countries in this. More overarching problems related to present national, ASEAN and EU policies will be discussed in chapter 6.

General pitfalls

Most Southeast Asian countries are developing countries, but in very different stages of development. While Singapore is generally seen as the most developed country in the SEA region with a well advanced S&T system, countries like Laos and Cambodia are considered as lagging behind, whilst other countries such as Vietnam or Indonesia are seen is taking middle positions. In cooperation with Europe, most of these countries have to face a rather uneven situation. A main cause of this is the fact that the level of national investment in the science and technology sector is relatively low.

Especially for the lesser developed countries in SEA, tackling these problems is like aiming at a constantly moving target. In Laos, for example, production standards were being raised to comply with western standards, but in the time these improvements took place, European standards were raised as well. But the fact remains that Laos (and other countries) are in need of additional applied research into production standards combined with short term implementation of results.

Related to this, another common problem is the lack of adequate and sufficient research equipment. Collaboration with Europe may be helpful here, but cooperation with other countries or institutes in Southeast Asia itself should also be further developed.

The unbalance between Europe and SEA, and within SEA, also works out in another way. In several Southeast Asian countries,

huge differences exist between regions or provinces. It is not uncommon that this results in a focus by foreign researchers on institutes in a dominant region or province only, thus adding to an already existing unbalance.

A rather different, but equally important potential pitfall is the brain-drain-brain-gain issue. Many projects with partners from Europe and SEA have an element of capacity building. However, institutes in the more developed countries are also trying to attract to most excellent researchers, to come and work for them, sometimes on a long term basis. These two counter-acting motives can exist within a single project (it is rather attractive for young students to spend time in an institute in a foreign country, especially if it is a renowned organisation). There seems to be a growing awareness among policy makers that one needs to set up special schemes to have the best of both worlds, on the one hand creating opportunities for talented researchers to learn in a different environment, on the other hand to profit from their knowledge in the home country in a later stage.

One of the issues most frequently mentioned by Southeast Asian scientists is the topic of intellectual property rights (IPR). These are clearly seen as a potentially beneficial outcome of international cooperation, but IPR remains a controversial issue, and often underestimated or sometimes downplayed by European partners. It appears to be very difficult to make arrangements concerning potential new patents at the start of new research cooperation. If this is not clearly dealt with at the beginning through clear contracts, especially in projects in the applied sciences, the collaboration tend to end when possibilities of commercialisation begin. In Southeast Asia in general, there is a need for less strict IP policies in order to productively share information.

And last but not least in this section, arguably more important than clear regulations and agreements for cooperation, there is the issue of building mutual trust, which is of great importance for sustainable cooperation of any kind, but certainly in S&T. Research collaboration projects that only run for a limited time are not only a waste of capital and human investment, but usually do not solve the problems that they were set up for in the first place.

Clearly, one needs to take into account intercultural differences too in approaching and setting up international projects. The colonial image of the Western researcher who comes to Asia to gather specimens or information may be a fading caricature, but shadows of this picture are persistent, with possible threats to fruitful mutual understanding. But also, and more importantly, the ways in which decisions are made about the project formulation, and in general the power balance between the different potential partners is an issue that needs attention from the start. A different level of information about conditions for funding usually exists and this in itself might already be enough to become a barrier for cooperation.

In any event, it is absolutely necessary to have a good and active network to set up international cooperation, both with Europe and within SEA. For this purpose, thematic bi-regional conferences and match-making events are considered very helpful.

Pitfalls in actual cooperation within Framework Programmes

In addition to the more general pitfalls mentioned in the previous section, a number

of problems can emerge when actual cooperation comes into sight, both within or outside EU Framework Programmes. This can be before, during or after a cooperation takes place.

A problem frequently mentioned by our respondents from SEA is the lack of clear information about Framework Programmes, not only on paper but also coming from NCPs. While the lack of clear information about framework programs is often seen as a problem also in Europe (though much has improved over the years), this is even more often than not the case in SEA. The language problem is frequently underestimated. Researchers from Laos, for example, express the need for assistance with writing applications for international projects, due to the general level of language education. This calls for better dissemination both prior to and at the beginning of a project and also brings out the importance of competent and experienced project leaders. It is obviously very helpful for cooperation with Southeast Asian partners if the project leaders have some experience in working with organisations from these countries. For successful Framework Programme projects it is also very important to have a good EU contact person (the project officer or scientific officer), preferably a person with some direct knowledge and experience of working with Southeast Asian institutes and the specific challenges such institutes are confronted with.

Many of our researcher respondents from both Europe and Southeast Asia perceived a lack of formal consultation possibilities during the process of formulating key areas for international research funding. They feel the need to raise the level of involvement of researchers themselves in defining key research areas for cooperation.

Such involvement is also necessary because many Southeast Asian researchers consider EU funded projects as far more complex to participate in as other forms of international (bilateral) cooperation. The amount of funding in bilateral projects is sometimes also higher (e.g. cases were mentioned with the Netherlands and France). More attention should be paid to overlap between bilateral arrangements and EU projects, in particular because it opens up learning possibilities (best practices, and building upon each other's experiences, sharing information or facilities).

More practical issues were also raised. Representatives of research institutes in Southeast Asia feel they do not have enough information on the specificities of financial accountability. Framework programmes have a reputation of creating huge bureaucratic burdens, and many in SEA ask themselves whether this is worth investing in in terms of the balance between costs and benefits.

Time frames of EU calls are considered by many to be too short to properly work out a joint proposal, especially between European and Southeast Asian researchers. This problem is at least partly related to a skewed distribution of information, where Europe is in a more comfortable position. And both Southeast Asian and EU researchers experience difficulties in pinpointing appropriate partners.

EU project durations of e.g. three, four or five years do not match the national timeframes in Southeast Asia when it comes to national matching. Often budgets within SEA countries need to be acquired on a yearly basis, where the process of receiving such funding takes another year. Usually during this process several national organisations or departments play a role.

The upshot is that in Southeast Asia co-funding mechanisms are more often than not inappropriate for successful participation. Because of this organisational mismatch, many promising opportunities cannot be realized. Long term financial commitment from SEA governments is sometimes further blurred by not completely consistent policies, and lack of transparency in the decision making process. China, on the other hand, uses five years time frames, on account of which matching of international projects is not a problem.

Wrap up

From the above we can distil a number of concluding remarks that might help prevent some of the major pitfalls in future cooperation. We will do this with regard to cooperation in a wider sense with regard to cooperation in the context of Framework programs.

Cooperation in general

Cooperation between Europe and Southeast Asia has to deal with a number of general potential pitfalls, some of them well known but still sometimes underestimated, and some less known or of more recent date (for example the current economic problems). Differences in development stage between (most) European countries and (most) Southeast Asian countries calls for a more specific approach in setting up programs. It is not appropriate to expect the same potential input from different possible partners: one size definitely does not fit all. Specific attention should be paid to local or regional problems and a major consideration should be the connection of these to global problems. As specific points of attention the brain-drain-brain-gain issue and the question of IPR were mentioned.

A problem for many national ASEAN governments is that they are currently unable to match for longer periods, not only due to the global financial crisis, but also due to governmental and administrative restrictions. Mutual adaption of budgeting system is called for.

Since there is a general criticism about lack of information about relevant research partners from Europe, it seems pivotal to improve the information and the dissemination about partners. Bi-regional thematic conferences and matchmaking events by EU and ASEAN together would stimulate building networks.

As a final point, it could help to improve the transfer of results outside academia. This could lead towards a better involvement of industrial stakeholders in projects and programs.

Framew*ork Programmes*

It seems imperative that more effort should be put in disseminating knowledge about the Framework programmes, in particular regarding the more practical aspects and consequences for administration and accountability.

What would help is also to improve intermediary functions, for which both the NCPs and EU project officers need to be available. This could also help mitigate the problem of different timeframes: for submitting EU projects time is usually too short for Southeast Asian partners. Prior to the opening of calls, pre-announcements should also be disseminated in Southeast Asia, via active National Contact Points.

Cooperation between Europe and Southeast Asia would benefit from involving Southeast Asian partners in defining a programme from the outset. It not only would raise the

commitment of researchers and stakeholders, it also would help balance the local/regional interests and the European goals. In general, joint EU-ASEAN identifying of key priority areas should be encouraged.

Mutual learning should be made a priority. For example, coordination between bilateral and bi-regional schemes can be improved, so as to avoid overlap, and to generate best practices. Framework programmes should explore building on existing bilateral programmes.

There could also more emphasis on impact and clear follow up strategies as part of a project can improve the results of temporary international projects.

2.5 Challenges for regional, national and supranational policies

Introduction

Based on the axiom that global problems require global solutions, for which international cooperation is necessary, an important question is how S&T agendas of ASEAN and Europe can be attuned in a meaningful way. Questions in point are:

1. how to overcome existing differences in S&T interests and policies in both regions;
2. how to determine the options for attuning national policies in both regions and the overarching ASEAN and EU policy;
3. how to assess the consequences for a new EU policy (e.g. dedicated programmes) towards SEA.

Several countries in SEA are currently undergoing a rapid transformation of their economies, reflected in the steady rise of investment in education and S&T. The common division in three levels of development (see Schueller et al) is arguably still visible, yet according to a number of our workshop participants, countries at the lower level are catching up. This process catching up forms a major challenge, because SEA countries deal with the combination of a high population density and a relatively low education level. For S&T cooperation to have long term effect, to focus on higher education and training of young talented researchers, seems obligatory. This might be the appropriate time to support that development with an extra EU effort. The education of young researchers might be a central element in such specific EU incentives directed towards stimulating bi-regional cooperation.

In discussions about S&T cooperation between SEA and Europe, the dilemma of investing on the one hand in capacity building for countries or institutes that lag behind, and on the other hand in cooperating between excellent researchers, is a central theme. The problem arises because these two goals, which can be summarized as "top research versus capacity building", vary to a considerable degree and can even be mutually exclusive. The question, then, is how this dilemma can be avoided or be transformed into a productive element when setting up cooperation. While there are differences within SEA in stages of development and thus in needs and interest when it comes to S&T cooperation, new initiatives should be wary of the fact that neglecting these differences can have major drawbacks for regional cooperation, and in fact might increase the differences. It is obvious that in an open competition for EU funds, some countries will stand a much

better chance than others, which not necessarily reflects wither quality or relevance of the research proposals.

Policy relations within and between both regions

Researchers from institutes in SEA consider sustainability (long term commitment) in international cooperation an important condition for re-enforcement of their infrastructure and human resources. European Framework Programmes generally fund projects or programs for a limited number of years (3-5). Together with the fact that open competition as a rule doesn't work evenly in the context of many SEA countries and institutions (given the uneven distribution of resources), this gives rise to at least two points. First, Framework Programmes are intended to stimulate new forms of cooperation, based on the assumption that after a period of several years many of these networks have proved to be self-sustaining enough for the participants to continue without further EU support, or are successful enough to actually compete for new funds. The question is then of course whether this is indeed the case. A critical analysis of whether or not this is actually the case is lacking at this moment. Secondly, many Europeans working with SEA emphasize the importance of building trust and overall good relations with the top of institutes and higher ranking officials. This can only be accomplished if longer term commitment is guaranteed.

Memoranda of Understanding (MOUs) and ASEAN policies

In most cases international cooperation entails that many different departments or national agencies work together. This usually leads to a rather intricate network of demands and interests that have to be mutually attuned, a very time consuming, process for which diplomatic skills are required. MOU's can be helpful in these situations.

While many researchers in Southeast Asia working in international networks stress the importance of MOUs, however, expectations of their impact and usefulness are easily overestimated. And precisely because of the politically sensitive nature of MOUs, some institutes prefer to work without MOUs and establish their contacts directly without ministerial interference.

Seen from the perspective of many SEA governments, ASEAN is important for the development of national S&T systems, not so much as an organisation that enforces particular policies, but as a framework in which comparison and learning is facilitated; specific improvements in the S&T system in one country has on several occasions stimulated policy makers in another SEA country to push for similar improvements.

Researchers and policy makers in SEA alike see the need for prioritising research in an ASEAN context. Countries try to influence ASEAN policy in the direction of their national priorities. If such a priority is adopted by ASEAN, this theme will in many cases receive even more emphasis in the national policy.

The ASEAN Flagship programs are seen as a good effort on the part of ASEAN to stimulate the regional R&D systems. These programs provide seed funding which allows for leveraging. Scientists are very much aware that working at a regional level instead of the national level may provide economies of scale if both financial means and physical infrastructures can be used more efficiently.

The ASEAN Science and Technology Fund (also known as ASEAN Science Fund, or ASF) was established in 1989 for the purpose of providing seed financing for the various programmes, projects and activities under ASEAN science and technology cooperation, as identified and approved by the ASEAN Committee on Science and Technology. At the moment, this source of funding is still very modest.

The ASEAN-European University Network (ASEAN Uninet) is a network of over 50 excellent universities, for which participants are selected. This network is currently at least as important as formal ASEAN S&T policy and initiatives.

Many Southeast Asian researchers need more information on international cooperation and more conferences to meet colleagues and define projects. Face-to-face meetings are still clearly preferred, as these are more successful in promoting a sense of mutual understanding and trust. Understanding and trust are pivotal for this kind of international cooperation.

Cooperation in national policies, some examples

Several countries consider international cooperation as a criterion in the internal quality control systems. International cooperation is thus in itself an indicator of success, i.e. as part of quality control and funding. In e.g. Vietnam internationally cooperation is clearly important for career advancement, and publications in English are worth ten times as much as publications in Vietnamese. Indonesia for instance provides more funding to institutes if they have international collaborations.

Laos seems to become more open to international cooperation, although no specific priorities are formulated by its national government. Laos is also an interesting example of the wider problem of the mismatch of national priorities and international priorities, as its government works with 5 and 10 year action plans. This makes it difficult to change national policies quickly in order to respond to outside changes.

In the Philippines, universities can cooperate with foreign universities directly, without the involvement of ministries. This is an advantage of institutes in the Philippines over many other SEA countries (however, the general problem of lack of contacts with foreign colleagues also applies to researchers from the Philippines).

Involving developing countries that have recently changed policies based on research outcomes could be a useful strategy for many SEA countries. Such South-South or North-South-South cooperation among research orientated policy makers have in several cases proved its use. ICT, a field in which many SEA institutes participate in Framework Programmes is a case in point. In this field Brazil is acting as an increasingly important partner in South-South cooperation. This is a clear example of a sector where research is only one element and has a clear relation with innovations in wider society. It is also a sector with possibilities for leapfrogging, i.e. skipping certain stages in technology development.

Wrap up

In general, a lack of coordination between university policies, national policies, and multilateral policies can be observed in the context of international S&T cooperation.

This applies both to the European and to the Asian side, but the main difference is that the level of investment is much higher on the European side, and therefore the number options for setting up cooperative research endeavours are considerably larger. However, despite the abundance of funds and options, it appears to be difficult for SEA partners to become serious partners in cooperative initiatives. The lack of coordination between research and policy is not helpful in this situation. In particular, feedback from successful projects or programs into the S&T system is low. There exists a relative lack of reliable statistical information on the S&T systems of several countries in SEA compared to Europe. Nevertheless, based on the interviews and focus groups conducted for this report, a number of preliminary conclusion can be drawn.

ASEAN

- It would be beneficial to the region if ASEAN would define clearer S&T priorities and objectives. This could also be an incentive for the EU to develop specific instruments for cooperation in those priority areas;

- Most SEA countries require the involvement of different national bodies in international research projects. This is seen by many researchers as an unnecessary bureaucratic burden. To address this issue, one of the options would be to make one department or agency responsible for formal aspects of international research projects, thus creating a single contact point for research institutes. This process may be facilitated by a policy dialogue on this topic within ASEAN;

- The ASEAN Science Fund is a useful instrument to improve research in SEA. At the moment this fund is rather modest;

- In many countries it is necessary to create more awareness about the EU as an important partner on S&T issues and bring this to the attention of the Department of Foreign Affairs.

ASEAN and EU

- During the biannual meeting between the EU and ASEAN, it would be beneficial to allot more time for a S&T policy dialogue, and specifically on the topic of research priorities;

- In the future, the possibility could be explored to organise joint calls by EU and ASEAN together, to which both sides contribute;

- A clear action plan from both EU and ASEAN in which benefits to both EU and ASEAN are explained would be very helpful to inform policy makers.

EU

- A clearer strategy of the EU as a single unified region, as against the individual European countries acting in SEA, would be beneficial;

- Translating information about EU programs into the various national languages would be helpful;

- European and SEA researchers could find more useful matches with EU support if the EU were to differentiate and set up dedicated schemes accessible for institutes from countries at different levels of development.

2.6 International S&T cooperation: with Europe and other parts of the world

Introduction

In a world of growing international cooperation but also of growing competition, SEA researchers and policy makers have to decide in what cooperative efforts they best invest their time. In this process many different considerations play a role. Content arguably comes first, but immediately following that policy considerations, cultural aspects and also rather practical issues come into play. Hence (perceptions of) the ease or difficulty in working with researchers from Europe in comparison with other regions or countries are of great importance. Whether Europe stands out in a positive or negative way depends to a large extent on what the EU has to offer: clarity about the options in Framework Programmes and other global initiatives.

What we have learned from our SEA interviewees and workshop participants is that most SEA researchers do not find it easy to obtain the relevant information about Framework Programmes, but once they have started up a project cooperation with EU they in general do feel working with EU to be very different form working with researchers in other parts of the world. They also find the final detailed reporting phase more difficult. In working with Japan, for example, the first start-up phase is often more demanding, and may take up to two or more years, but once funded, a much more liberal approach in project management and control is in place. This section discusses some of the differences, from a SEA perspective, between working with researchers from Europe and working with researchers from other regions.

Cooperation in the context of EU and other regions

In order to compare SEA-EU cooperation with cooperation with other regions, one first has to identify the goals of the EU with regard to cooperation with SEA. That, unfortunately, is not very clear. In comparison, Africa seems to be getting much more focussed attention from the EU, especially after the launch of the EU-Africa Strategic Partnership at Lisbon in 2007. For SEA, there are however various separate country-specific funds. Vietnam for example is setting up 17 key laboratories with EU aid. Part of the problem for the EU when dealing with SEA is the region's diversity, bringing with it tensions between capacity building and cooperation between more or less equal partners in science and technology. In Africa, similar tensions exist, but for the majority of African countries cooperation takes place as a more or less unified form of capacity building.

Another important factor when comparing cooperation between different regions in the world is the relative closeness in terms of culture and geography. It is in many ways easier to work with other SEA countries in the region, or with Japan, India, Australia or China: visiting research sites or meeting at a workshop is easier and even teleconferences are less difficult to arrange frequently if all participants work in nearby time zones.

Many Southeast Asian researchers in the Bali workshop mentioned that the success rate is low when competing for EU funding in comparison with funds from other countries outside the EU. Hard figures are lacking, but in general the success rate in EU funding is

below 20 percent for Framework Programmes.

While many Southeast Asian researchers are interested in getting involved in international cooperation with European researchers, they often find it difficult to gain support from government officials and policy makers. A main reason is the lack of knowledge about the possibilities of EU framework programmes, sometimes simply because specific documentation is available in English only and not in the national languages. Clear guidelines on procedures from the EU for potential participants from SEA would clearly be helpful.

Another potential pitfall is the fact that researchers generally consider EU projects to be very large, and because of the number of partners too difficult to efficiently participate in. Researchers often prefer small-scale bilateral cooperation with European partners.

Overall, SEA countries do not perceive the EU as one unified body, but see the EU as an collection of heterogeneous individual countries. This perception is further enhanced by the existing long-term relations with particular countries, relations that do not as yet exist with the EU as a whole. Typically, national delegations of European countries in SEA are as a rule much larger than the EU delegations.

Many SEA researchers feel that Europeans use different approaches in their work than SEA researchers. Two examples of these differences between Europe and other regions are:

1. Project management. In European projects, the work is structured in clearly defined work packages and outputs and expectations are clearly defined. This enables researchers to focus. It is useful for participants to have clearly defined deliverables, such as the European project managers have set out in their work plans. SEA researchers feel they can take certain aspects of planning and control by European colleagues as examples of good practice.

2. A more straightforward European versus a more circumspect Asian approach. Some feel that Europeans lack what is called ´the Asian spirit´. Europeans in general tend to be more bluntly direct in their behaviour, while Asians on the whole lean to a more sensitive mode of behaviour. S&T relationships within SEA tend to have a long start-up phase because of this, but eventually are more long-lasting and robust.

Establishing relationships with Japanese institutes can thus be a lengthy process but once a relationship is established, it tends to be more firm and more sustainable in the long term. One example of a successful programme with long term planning is the Biomass Asia Research Consortium, with two institutes in Thailand, one in Vietnam, Indonesia and Malaysia and China, and five in Japan.

Some interviewees also indicated that Japan tends to have more interest in their country's national priorities than does Europe. Much emphasis is put on training young people and investing in stimulating S&T infrastructures.

There are many competitive initiatives in the region for S&T cooperation. Three examples:

1. The Pacific Rim cooperation, via the Association of Pacific Rim Universities (APRU), is a network consisting of 36 selected research universities aiming at "fostering education, research and enterprise thereby contributing to the economic, scientific and cultural advancement in the Pacific Rim." APRU's activities include strategic initiatives to promote entrepreneurship amongst its membership and the use of advanced ICT in the delivery of education. Pacific Rim cooperation may very well become more important in the future and deserves further study in order to improve SEA-EU cooperation.

2. Australia has started building up research links with SEA in the 1950s. In the 1970s Australia also became ASEAN's first dialogue partner, that is the first country ASEAN agreed to meet on a regular basis to discuss political, economic and functional cooperation. Part of the cooperation was set up via The ASEAN–Australia Development Cooperation Program (AADCP). In the 1990s an Australian-ASEAN project focused on advancement in biotechnology was set up. Australia is also an important factor in international training of SEA students. In 2007, over 65 000 students from ASEAN countries were studying at Australian educational institutions.[32]

3. Cooperation between New Zealand and ASEAN started in 1975. This cooperation today incorporates S&T, and New Zealand has contributed to the ASEAN Science Fund. These S&T links between SEA and Australia and New Zealand, with often elements of mutual benefits, may be useful cases for further study.

Some country specific examples

Indonesian researchers would like to see more of a reciprocal relation in student exchange, by stimulating the number of EU graduate students coming to Indonesia. In recent years Japan and Korea have been raising the numbers of PhD students going to Indonesia through specific programmes. Over a longer period a shift can be seen; decades ago many Indonesian researchers who were trained abroad had done their PhD in Germany. This then shifted to the US, then to Japan. Nowadays India and China train a lot of Indonesian PhD students. These shifts are partly related to the higher living costs in the EU and the US.

In the case of LAPAN, the National Institute of Aeronautics and Space in Indonesia, recent international cooperation with Germany was primarily focussed on technology, whereas with Japan it was possible to set up cooperation with also invests in training of Indonesian researchers.

In Laos the need is felt for more information on opportunities for cooperation with the EU. Information on collaboration possibilities with Japan, Korea and China is readily available, whereas information on cooperation with EU is not. Korea and Japan also have experts in Laos, and their presence often leads to future research projects. Such experts also more frequently learn the national language.

32 http://www.dfat.gov.au/facts/asean.html

The Philippines traditionally were strongly focussed on working with the US. A recent shift towards the UK has set in. There is not much cooperation with the rest of Europe, which could be changed once knowledge about potential partners is more widely disseminated, in both the Philippines and Europe.

Wrap up

When building and maintaining successful S&T cooperation between Europe and SEA, one needs to consider a number of important issues. These issues can be divided into socio-cultural differences, geo-political aspects, content-oriented and practical points.

Socio-cultural differences between researchers do not seem to matter so much once a project is on its way, but can be a barrier before projects start. This might be caused by the way research topics are decided upon, or the overall approach towards research projects, or the issue of formal project-leadership.

Geo-political aspects are hard to overcome because they have their own dynamics. People often find it easier to interact with people in their own region, and the interests of one region is likely to differ from the interests of another. It might be more productive to focus on cooperation instead of competition. This is of course easier said than done in a world of growing global competitiveness, but since many problems in society are truly global, solutions need international cooperation. So it seems much more productive to see developments in the Pacific Rim or Australia or India in terms of cooperation than of competition.

Regarding the content of cooperative projects or programmes, there would ideally be a joint agenda between SEA and EU, like in the case of Africa. Such a framework could serve as an agenda for new cooperative projects. Failing that, the direction of new endeavours is up to individual participants. Not all SEA participants in projects with European partners, especially in larger projects, have the experience that they could provide a satisfying input in the beginning when project plans are formed. In the perception of SEA researchers, they have more influence in these import first steps of setting up a cooperative effort with Asian partners. Furthermore, SEA researchers feel that governments in the region, especially Japan, are paying more attention to national priorities of SEA countries than Europe does. Japan is also mentioned as a country that is more open to help build S&T infrastructures, and to train young researchers (capacity building). The image of EU researchers as simple sample gatherers in short-term projects is persistent.

Also, for less developed countries such as Laos or Cambodia, Japan and Korea seem to be more willing to provide local R&D experts, who often are willing to learn the national language.

As a final remark, we would like to emphasize the importance of efforts to stimulate the education and training of the next generation of researchers. The importance of this cannot be overestimated, especially with the growing level of education in many SEA countries. Informants from most countries stressed the importance of this point, and with countries like Japan, Korea and China being very active in this field, and raising their investment off late, there is a world to lose for Europe.

2.7 List of Opportunities and Pitfalls

This chapter lists the opportunities and pitfalls that were brought up during the various focus groups and interviews. We have refrained from giving specific recommendations in this analysis of opportunities and pitfalls. In 2010, the SEA EU NET project will publish short- and long-term recommendations linked to a foresight on SEA-EU cooperation in 2020, after consulting high-level political stakeholders and programme owners.

International S&T cooperation

Opportunities

"Global problems need global solutions." Global solutions can only be realized by building international networks of researchers and their institutes and establishing appropriate S&T policies. In order to obtain better opportunities for successful international cooperation most of our respondents listed the following opportunities:

1. Involve researchers, policy makers, and other relevant stakeholders in priority setting decisions for collaborative programmes as early as possible;
2. Involve SEA partners in priority setting and in the planning and design phase of the project from the outset;
3. Fully engage all project partners in the research and project itself, and ensure that every project partner is a fully committed stakeholder;
4. Research should, to a large extent, be driven by local, regional, and national problems. Collaborative programmes should consider the potential befits to the economy and society SEA, and not primarily driven by a European perspective;
5. Attention should be paid to the follow-up of temporary projects: establish scientific tools and infrastructure, implement policy changes that extend beyond the scope of a particular project;
6. Take into account the different perspectives and interests regarding the goals of international S&T cooperation of researchers on the one hand, and policy makers and other stakeholders on the other;
7. Give due consideration to cultural differences and differing socio-economic needs;
8. Encourage full participation of the private sector in collaborative research projects to foster better connections between academia and industry, and to enhance opportunities to finance projects. IPR issues should be covered in the project terms of reference.

Pitfalls

1. Overlap between bilateral and bi-regional schemes should be avoided by building on (the experience obtained in) existing bilateral programmes;
2. A lot of opportunities are missed by a sheer lack of knowledge about relevant potential partners, in both regions. Initiatives should be taken to help providing such knowledge;

3. During meetings at the highest political level between the EU and ASEAN, a more developed and strategic dialogue should be cultivated to address key S&T related issues.

Whilst these points might seem fairly obvious, most of our respondents strongly felt that EU funding mechanisms do not seem to recognize them, and that EU civil servants often are not familiar enough with these issues.

S&T funding instruments

Opportunities

1. Establish long-term research centres where scientific tools can be implemented, and new knowledge can be developed. These centres of excellence would help to turn short-term results from temporary projects into long-term benefits for science and society.

2. Establish research schools adjacent to research centres to offer returning students and scholars an attractive environment, so as to handle brain drain problems, and educate new generations of scientists;

3. SEA's S&T systems would benefit from having more strong and recognisable research centres, especially focussed on themes that are directly relevant to the region, like e.g. marine biology, coastal zone research, fishery, forestry.

4. Attract more foreign researchers by research centres, possibly organised at the regional ASEAN level, thus stimulating interaction with local researchers, and providing a stepping stone for researchers to find their way in the region.

Pitfalls

1. The ASEAN Science fund for improvement of research is unfortunately very modest;

2. Administrative burden and tight and restrictive rules make it more difficult for SEA to become fully engaged in the research, and fully responsible for the project in bilateral and EU projects.

EU Framework programmes

Opportunities

1. Make available easy-to-read information about the FP programmes and the opportunities it creates for SEA;

2. Improve information dissemination (by National Contact Points) prior to the opening of a call, as is the case within Europe, and provide information on potential partners;

3. Provide experienced and knowledgeable project managers and EU project officers;

4. Launch joint calls by EU and ASEAN, and organise network and relationship building activities between researchers in SEA and Europe.

Pitfalls

1. Insufficient time following the release of calls for proposals is allowed for the drafting and submission of proposals. Current

time frames are too tight, especially for many SEA scientists;

2. There is a mismatch between EU funding cycles (grants for several years) and the required matching funds from SEA, often governed by yearly national funding cycles;

3. Discouraging organisations from third countries to act as a project leader in a FP project is not an incentive for possible SEA partners to join projects, and is generally regarded as a sign of distrust. Discouraging SEA partners to act as project leaders, regardless of the ambitions of a potential SEA partner, is a sensitive issue;

4. Continuity and sustainability of S&T cooperation with European collaborative project is a problem, especially when compared to Asian partners such as institutes in Japan and Korea. Links with these institutes tend to be more firm and have a more long-term character than with European partners;

5. Framework programmes are considered to be very competitive in a way that does not take into account the various levels of development in ASEAN member states;

6. Framework programmes do not offer earmarked funds for specific regions. European and SEA researchers could find more useful matches with EU support if the EU were to differentiate and set up different schemes accessible for institutes from countries at different levels of development. This could be translated into a specific funding calls targeted at cooperation with SEA;

7. In general cooperating in Framework programmes carries a large administrative burden, also when compared to working with individual European countries. Clear and easy to follow guidelines as to reporting and project management are lacking.

Capacity building schemes as pre-requisite for S&T development

Opportunities

1. Training schemes for young researchers should be setup to create a strong base of national scientist in SEA;

2. Focus on helping to build long-lasting soft and hard S&T infrastructures. Projects should be formulated with that goal in mind;

3. Attractive positions should be created within the knowledge system for excellent young students;

4. Promote a more equal exchange of scientists between SEA and Europe, and create mechanisms that redress the imbalance between the number of SEA researchers going to Europe and European scientists going to SEA.

Pitfalls

1. Southeast Asian infrastructural weaknesses;

2. Low overall national budgets for S&T;

3. Focus on other than S&T priorities reduces the (financial) incentives for S&T cooperation.

3. Section: Regional Perspectives on S&T Cooperation between Southeast Asia and Europe

Compiled by: Alexander Degelsegger and Florian Gruber on behalf of SEA-EU-NET

3.1 Introduction

This section is based on the outcomes of a SEA-EU-NET scenario building workshop held in Bogor, Indonesia, with the topic of future scientific and technological (S&T) cooperation between the two regions of Europe and Southeast Asia at region-to-region level[33] in 10 years time.

The aim of the workshop was to gather structured advice from a group of selected experts from both regions on a bi-regional S&T cooperation success scenario, more particularly on the question what the encouraging and constraining forces would be for unfolding such a scenario. The experts were asked to identify, along different policy areas, issues that directly have an impact on the development of a specific future S&T cooperation scenario, and where the success or failure of taking them into account by policy makers in the present would determine the success or failure of the coming future scenario. In addition to these driving forces directly relevant to any policy-making and scenario-implementation intention, the experts were also asked to identify shaping factors, i.e. environmental factors that can not be directly influenced, but can nevertheless trigger relevant effects and form the context to which the future scenario must and will be adjusted.

The drivers and shapers were obtained in brain-storming like fashion applying a two-step procedure in order to allow for data validity and robustness: After identifying and considering drivers and shapers, the importance of each of these factors was evaluated in a second step by the experts for each region.

In considering the results of this exercise, policy recommendations can be deduced that can proof valuable for any attempt to advance S&T cooperation between Southeast Asia and Europe on a bi-regional level.

Most important outcomes:

Drivers:

Taking a look at success factors of a scenario of Europe-Southeast Asia scientific cooperation in 10 years time, the experts agree that the combined tackling of "global issues" is one of the most important driving forces for cooperation, and for some Southeast Asian countries a question of survival in the face of climate change, rise of the sea level and flooding of substantial areas of the region. Achieving regional "excellence", be it in the purely scientific or in the industry-innovation area, seems to be the most important "egoistic" driving factor. The importance of mobility and the internationalization of the scientific workforce were emphasized by all experts, as well as joint programmes for research funding.

Southeast Asian experts put more emphasis on, (paid more) attention to financial aspects of the cooperation, as well as on a favourable policy framework not only in higher education and research policy, but

[33] A series of foresight workshops in 2010 will additionally take into account the region-to-country and country-to-country level.

also in financial, trade and economic policies. It seems that for a successful regional cooperation with Europe from the Southeast Asian side, the integration of the region as well as the economic power has to increase in order to allow for cooperation on equal footing. However, this rise in Southeast Asia's economic power would only come if attention is paid and support is given to less developed countries.
Both sides emphasized that good and stable diplomatic relationships were a cornerstone of successful future cooperation.

Shapers:
Considering the factors that have no direct impact on the emergence of the specific scenario of successful SEA-EU multilateral S&T cooperation in 2020, but nevertheless are important shaping factors within the scenario, the viewpoints from the two regions vary more than in the identification of drivers.
Looking at impact factors the European experts emphasized *global challenges*, *IPR issues* (also a driver), the *development of common or harmonized monitoring/evaluation/impact assessment methodologies* and *support regional S&T institutions*. On the other hand, the Southeast Asian experts were more looking at the outcomes of *financial and environmental crises*, *management capacities* and *global challenges*.
Experts from both regions emphasized the role of *common R&D areas* as a shaping factor for future bi-regional S&T cooperation.

Recommendations:
In regard to a long-term view of a successful scientific cooperation between the region of Southeast Asia and the region of Europe some issues were stressed repeatedly in the workshop and in the concluding round:

- Research infrastructures should be supported. Linking S&T with development cooperation programming would be a useful and recommendable step in this direction, possibly increasing the availability of technical and scientific skills.
- Inter-regional Joint Research Centres should be established, the first of which can subsequently serve as best-practice examples. Joint Research Centres would additionally help improving the research infrastructure and increasing the availability of technical and scientific skills.
- Existing mobility schemes should be extended and new kinds of mobility support developed. This should help to attract more European researchers to work in Southeast Asia and to ease entry conditions for Southeast Asian researchers in Europe.
- Joint calls should be designed and implemented, starting with themes of common or global interest in applied and innovation-relevant research fields.
- S&T cooperation mechanisms should be stable enough to outlive external shocks and crises, but at the same time flexible enough to incorporate new thematic interests arising from these shocks.
- Policy measures in the context of bi-regional S&T cooperation between Southeast Asia and Europe should be coordinated with economic and trade policies.
- The region-internal integration of Southeast Asia could help mitigate the differences of economic development between the countries that are currently still becoming more pronounced. An integrated, regional S&T cooperation approach

would have to focus more on the self-awareness of Southeast Asia as a region and on decision making processes being implemented on regional level.

- Topics of common interest have to be found for common calls, but the more challenging recommendation is to set up new bi-regional cooperation instruments or mechanisms with substantial funding to improve the cooperation (e.g. joint programming or ERA-NETs).

3.2 Methodology

Over the years, scientists and policy-makers have used several methodologies to gain insights into the future and develop action-orienting conclusions according to a desired version of the future. When it comes to international scientific and technological cooperation policy, however, the approach of scenario building based foresight has shown to be rather successful[34]. An exemplary effort in this direction can be seen in the SCOPE2015 foresight project, a foresight exercise conducted for the INCO department of the European Commission in cooperation with PREST/Manchester[35]. Currently, several INCO-projects[36] or, for example, the International Council for Science (ICSU)[37] are using or planning to use scenario techniques for S&T cooperation relevant foresight exercises.

Scenarios are built up from collective visions of the future of a group of experts and should help decision-makers and other stakeholder groups to simplify "the avalanche of data into a limited number of possible states"[38]. Scenario building efforts often start with the clarification of the setting, the identification and analysis of driving forces that will most probably directly affect the coming into being of different aspects of future developments and a subsequent importance ranking of the identified drivers as well as of uncertainties that might have become apparent. Then, the scenario logics are defined, scenarios fleshed out and their implications discussed[39]. Thus, generic scenario building exercises comprise an exploratory elaboration of several futures that range from wanted developments to futures that are better avoided.

In addition to exploratory scenario building processes resulting in multiple scenarios, another approach is outlined in literature, namely the "success scenario" method[40]. Therein, an effort is made to present an image of a desirable condition in form of one single scenario in order to help decision-makers reflect the current situation and identify crucial steps in view of a favourable future. A related scenario building exercise

[34] Scenario techniques are also used in thematically much broader foresight exercises as the recent European Commission (2009) report "The World in 2025. Rising Asia and Socio-Ecological Transition" shows.

[35] For the final report see: European Commission (2006): Scenarios for future scientific and technological developments in developing countries 2005-2015, EC DG Research: Brussels.

[36] Next to SEA-EU-NET: EULAKS, New INDIGO and ERA-Net RUS to name but a few.

[37] ICSU Foresight Analysis on the potential development of international science, online at: http://www.icsu.org/1_icsuinscience/PDF/ICSU_Foresight_summary.pdf, most recent access date: 3 March 2010.

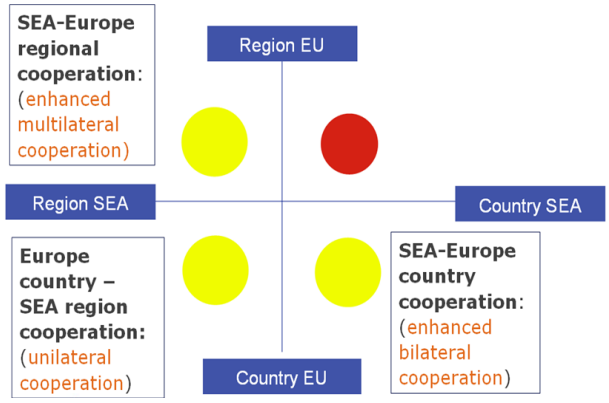
[38] Schoemaker, Paul J.H. (1995): Scenario Planning: A Tool for Strategic Thinking, in: Sloan Management Review, 36(2), p. 27.

[39] ipts/Joint Research Center of the European Commission (2007): Online Foresight Guide. Scenario Building, online at: http://forlearn.jrc.ec.europa.eu/guide/3_scoping/meth_scenario.htm, most recent access date: 3 March 2010

[40] Miles, Ian (2005): Scenario Planning, in: UNIDO Technology Foresight Manual. Volume 1 – Organization and Methods, 168-193.

can then be used by decision makers to streamline their approach to the topic in question. As Vincent-Lancrin has put it: "Future scenarios do not aim to predict the future […] but merely aim to provide stakeholders with tools for thinking strategically about the uncertain future before them, which will be partly shaped by their actions and partly by factors beyond their control"[41]. This "singular scenario" approach is also useful when it comes to structuring and guiding discussions so that underlying assumptions become clear and can be explicated[42].

The SEA-EU-NET Foresight endeavour aims at involving science and technology policy-makers and other stakeholders in a dialogue reflecting upon the future of S&T cooperation between Europe and Southeast Asia. The project addresses Southeast Asia as a region and represents regional European S&T policy as well as a European Research Area – thus, the bi-regional perspective is inherently part of the project's analysis focus. Nevertheless, bilateral S&T cooperation or constellations bringing together one region and single countries are also within its reach. Thus, we could anticipate that the regional-country dichotomy appears as an axis for our scenario logics, resulting in 4 possible base scenarios (region-region cooperation, region-country, country-region and country-country), three of which seem principally relevant[43].



Going one step further in the anticipation of scenario logics, S&T cooperation intensity and the question of suitable cooperation instruments appear as an additional axis.
The Bogor foresight workshop offered the possibility to gather policy-makers and programme owners from different countries in both regions within a bi-regional event round one table. As resource constraints are always a pressing issue in high-level foresight processes, aiming not only at stakeholder participation, but also at creating commitment, it seemed feasible and suitable to focus in the beginning solely on the region-region perspective. While this is, as stated above, inherent to SEA-EU-NET's design as a project, the idea that bi-regional cooperation should in principle serve both sides is equally at the core of the project's work. In addition, preparations showed that the question of the feasibility and necessary framework conditions of a dense and intensive cooperation scenario between both regions raise the highest interest among stakeholders.

Consequently, we opted for an extended single success scenario method with a pre-defined "summer" scenario (based on desk research) applying an inward bound perspective[44]. This means that we combined

[41] Vincent-Lancrin, Stéphan (2009): What is Changing in Academic Research? Trends and Prospects, in: OECD (ed.): Higher Education to 2030. Volume 2. Globalisation, OECD: Paris, p. 173.
[42] Miles, Ian / Green, Lawrence / Popper, Rafael (2004): FISTERA WP4 Futures Forum. D4.2 Scenario Methodology for Foresight in the European Research Area, European Communities: Brussels.
[43] In case the experts emphasise the importance of the region EU – country SEA perspective, we will additionally take this into account in the forthcoming foresight workshops.

[44] Miles, Ian (2005), p. 169.

the scenario discussion with a backcasting[45] element looking at the driving and shaping factors[46] for the scenario starting from the desired future going backwards towards present times. This is also why the results of this scenario building effort can be translated into concrete policy recommendations.

Besides the advantage to capitalise as much as possible from the available resources in terms of participating experts, this scenario planning design, implemented in a highly interactive half-day workshop, also offered the possibility to evaluate the "desirability" and "credibility" of the basic scenario which, according to Miles[47], are considered important elements of a success scenario.

The workshop design has proven a successful adaption of standard scenario methods for

- a setting involving high-level participants,
- facing time constraints,
- when discussing the viability and surrounding of a specific and possibly successful scenario[48] with the aim to sensitise for this possible future, create commitment for it and trigger a joint planning process.

The participants of the scenario workshop were the members of the SEA-EU-NET Steering Committee, as we assumed that the body (installed to have an overview on EU-SEA scientific relations to be able to steer the project) would also be the most suited one to take a look and think about future bi-regional cooperation. Concretely, 16 experts from policy-making and programme-owner institutions actively participated in the scenario workshop, 7 of them speaking for Southeast Asia and 9 for Europe. Please refer to Annex 4 for a complete list of participants.

As a starting point, the participants were introduced to and confronted with the following basic "summer" success scenario:

> **Basic scenario:** In the year 2020 the cooperation in S&T between the EU and ASEAN had reached a level of importance that some years before was hardly to be expected. Major development was the raise of ASEAN as a regional power, as the countries in the region decided to put importance to and budget into this umbrella organisation. In this way, ASEAN could initiate symmetric cooperation partnerships with the other major global players, the EU, the USA, and major S&T powers Consisting also of countries that differ quite a lot in their economic development, the European Union was considered an important cooperation partner, and with dedicated programmes including joint programming and funding from both sides, the cooperation in the area of S&T grew ever more intense.

We asked the participants of the workshop to project themselves 10 years into the future and to "be inside" a scenario where regional scientific cooperation between Europe and Southeast Asia has come to be very active, very successful and intense.

Then we asked the participants to identify the drivers for such a scenario; forces that would have to be identified and taken into account 10 years before (i.e. now, in the present) to lead to such a scenario. Due to the interaction dynamics in the brainstorming character of this session, we applied a rather broad definition of "drivers". Sticking to a stricter definition would imply to correct the flow of ideas which could then even stop the creative process – this was to be avoided.

[45] Popper, Rafael (2008): Foresight Methodology, in: Georghiou et al. (eds.): The Handbook of Technology Foresight. Concepts and Practice, Edward Elgar: Cheltenham, 54.

[46] For a definition and indicative listing of possible drivers and shapers, please refer to Miles (2005), p. 190 et seq.

[47] Miles, Ian (2005), p. 184.

[48] Indirectly, the desirability of the scenario can be deduced from the reactions of the experts.

The drivers were structured along 5 policy areas[49]:

- Higher Education Policy,
- Science and Research Policy
- Industry, Trade and Economic Policy
- Development Policy, Global Challenges,
- Diplomacy, Foreign Policy, Security Policy

In a second stage of the workshop we asked the experts to take a regional view depending on their origin, and to rate the importance of the drivers using a grade-like rating in relation to either Europe or Southeast Asia (after re-coding for visualisation reasons: 5 points express highest importance and 1 least relevance). It is important to point out that not all experts had to rate the drivers. The number of experts assigning grades to the drivers, thus, is an additional measure for the perceived prominence of this driver (in addition to the average grade, for sure). Chapter 2 will analyse the outcomes of this exercise.

Then the experts were asked to identify, which factors would most likely be the most important shaping factors for the scenario, which had come into being. Box 2 shows the collection of shapers. In a second step the experts were asked to comment the proposed shapers (which are basically names without descriptions), so that everybody would know what is meant by a particular shaping factor. And then, thirdly, the experts were asked to once again rate the importance of the shapers in relation to their region by awarding "points". Here, no grades from 1-5 were asked, but each participant had a maximum of 10 points to assign to all mentioned shapers. The experts were also invited to comment on the presented drivers. Chapter 3 deals with the outcomes of this shaper identification, rating and commenting session and Annex 3 presents the full data gathered.

Finally, it is important to highlight that in both parts of the exercise, participants were invited to consider and grade[50] a number of pre-given, indicatory drivers and shapers (given to orient and stimulate the discussion), but then to go beyond that and add other drivers and shapers they consider important. Experts have made extensive use of this possibility – see Annexes 3 for a complete listing of pre-given and added drivers and shapers (and the comments regarding the shapers).

3.3 Drivers for SEA-EU S&T Cooperation 2020

The full list of drivers, and the respective number of experts from Europe and SEA that indicated their estimation of importance can be found in visualised form in Annex 3 of this report. However we will highlight the most interesting points for each policy area.

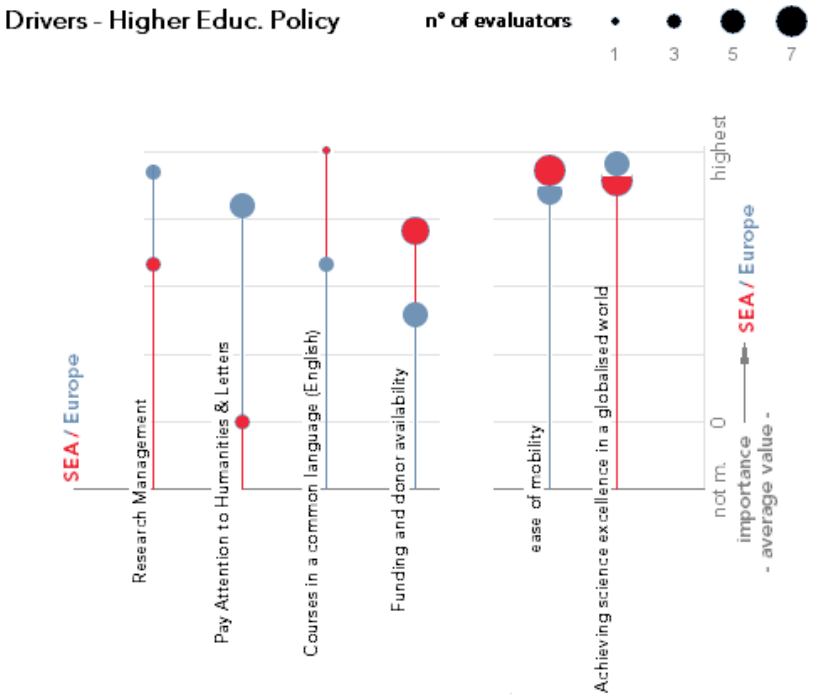
[49] Based on a compilation of policy areas from a presentation by Callum Searle, DG RTD D2 International Co-operation, Forward Looking Activities and International S&T Co-operation, 2 June 2009

[50] Again, not all experts had to grad all shapers. They could select freely. As in the case of the drivers, this offered additional information for the interpretation and analysis of the importance of the shapers.

Higher Education Policy

In the field of higher education policy, *ease of mobility* and *achieving science excellence in a globalised world* were identified by experts from both regions as the most important driving forces for achieving a high level of region-region cooperation between Europe and Southeast Asia. The far-ranging driver *favourable policy background* was slightly more important for the SEA experts, whereas *internationalization of education* was highlighted mainly by Europeans, while among the SEA experts very different stances towards this issue among them.

Discrepancies between the two regions are most prominent, however, in the rating of the importance of drivers like *funding and donor availability* (more important for SEA experts), *research management* (more important for European experts) and, most notably, *humanities and letters*, with good support from the European side and none from Southeast Asia. The following diagram shows a selection of drivers that were estimated as highly important (left part of the diagram) and where views differed significantly (left part of the diagram).

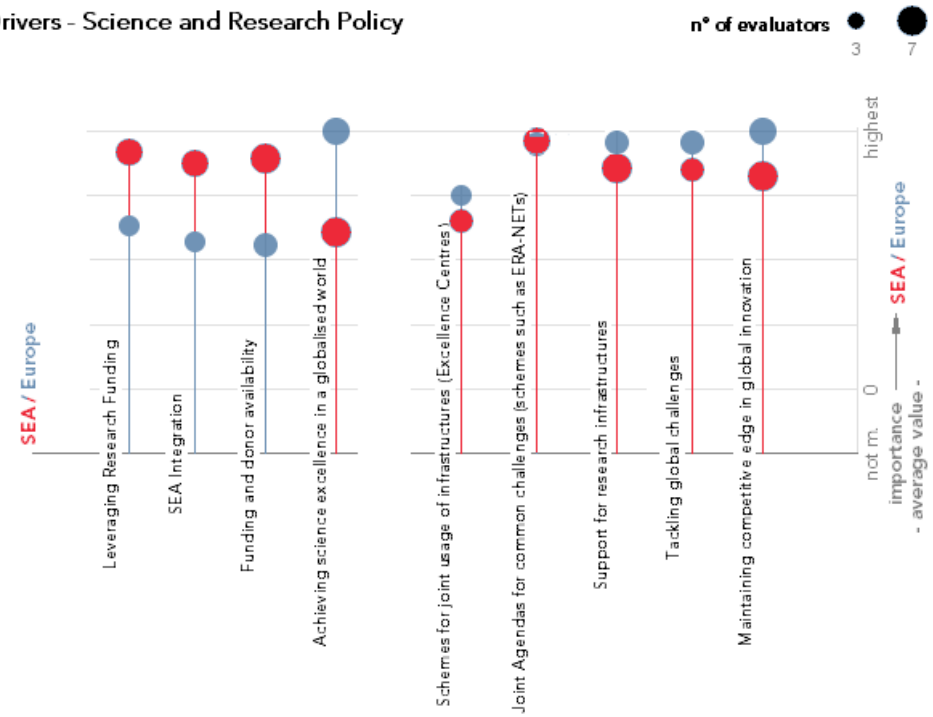


Science and Research Policy

In this policy area we have one driver that experts from both regions consider outstandingly important, which is *Joint Agendas for common challenges such as ERA-NETs*. Participants from both regions, furthermore, agreed upon the relevance of *maintaining a competitive edge in global innovation*, *tackling global challenges* and *support for research infrastructure* as factors that can drive (or hinder) the development of a successful bi-regional high intensity S&T cooperation scenario. One additional driver should be highlighted as it complements the last-mentioned support for research infrastructure: *Schemes for joint usage of infrastructure, such as 'Excellent Centres'* were also perceived as quite relevant by the whole group of experts.

As can be seen in the following diagram, less consensus prevailed regarding a set of four other drivers: European experts emphasized

Achieving science excellence in a globalised world[51] and, to a minor extent, *Diversification of Partners*, while SEA experts assigned more prominence to *Leveraging Research Funding*, *Funding and donor availability* and *SEA Integration*.



Industry, Trade and Economic Policy

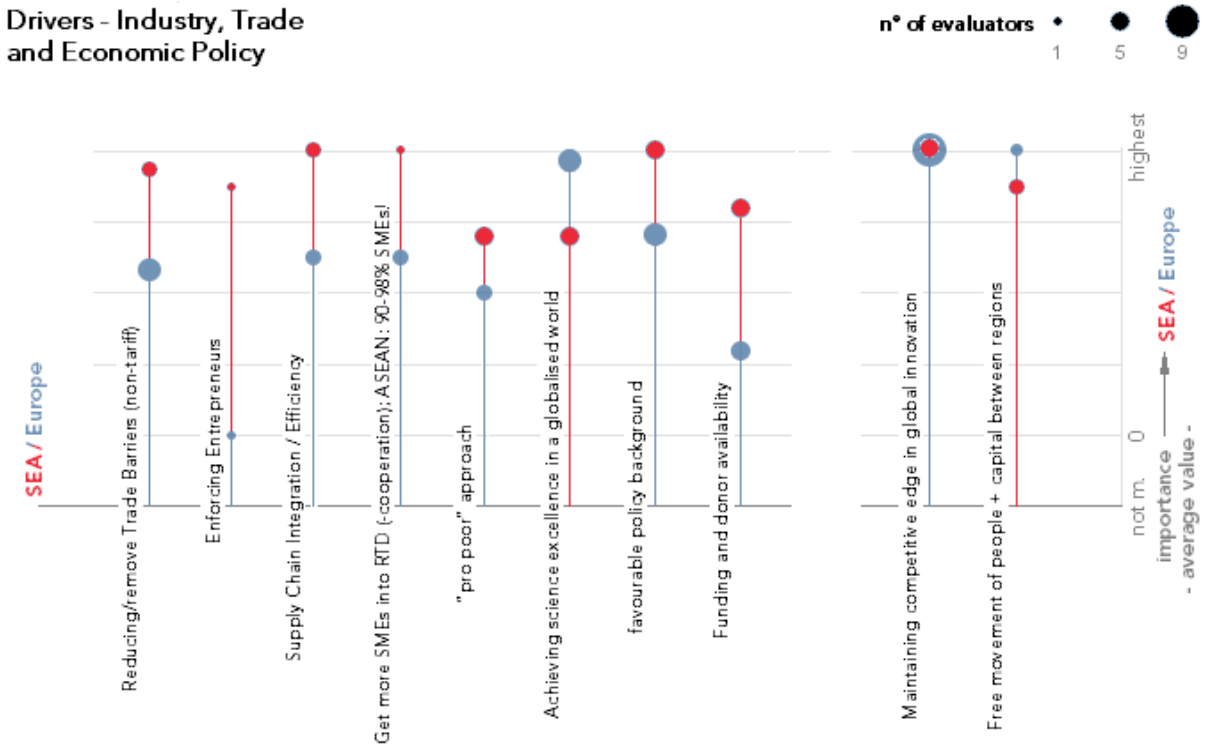
The discussions around the policy fields of Industry, Trade and Economy resulted in the most diverse and differently assessed picture among the scenario workshop results. The participants from Southeast Asia and Europe agreed in assigning outstanding importance as a driver to *maintaining a competitive edge in global innovation* and, to a lesser extent (less experts giving a grade, however with a similarly high average grade) to the free movement of people and capital between regions.

Regarding a set of other drivers that were proposed for considerations or that popped up during the discussion, considerably discrepant views prevailed, most notably when it comes to trade and economic factors. *Getting more SMEs into RTD cooperation*, *supply chain integration/efficiency* (average of 5 points from SEA against 3,5 points from Europe in both cases), *enforcing entrepreneurs* (average of 4,5 against 1 from Europe) and *reducing/removing trade barriers* (4,75 against 3,33 points average) were all regarded as much more important by SEA experts than by European experts.

[51] As we have seen, in the field of Higher Education Policy, experts from both regions agreed to science excellence as a crucial driver. In the field of Industry, Trade and Economic Policy, it is rather like in the case of Science Policy: European experts emphasize this point more than SEA experts do.

An additional fact can be seen as enclosing the aforementioned list at a superordinate level: A *favourable policy background* in this policy area was considered absolutely crucial (average of 5 out of 5 points) by the SEA experts participating (with 5 out of 7 giving grades). Two thirds of the European experts present considered the issue an important, but no crucial driver (3,83 points out of 5). One third of the European experts did not vote on the issue. While not all SEA experts considered these issues worth expressing their opinion on, those who did (between 2/7 and 5/7) underlined the importance of the trade and economic policy background drivers.

Apart from these, as mentioned already, science excellence, here, is seen as a most important driver by European participants, while a "pro poor" approach and questions of funding and donor availability are considered important drivers by Southeast Asian experts rather by Europeans.

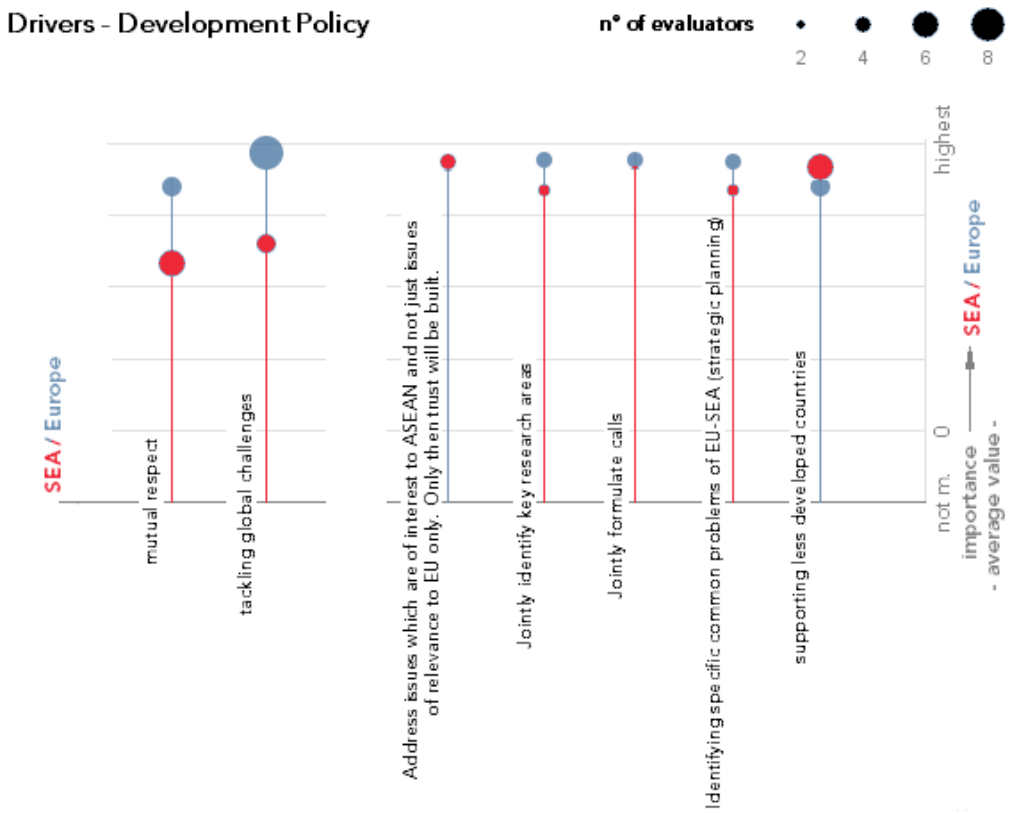


Development Policy and Global Challenges

In contrast to Trade and Economic Policy, in the case of Development Policy, Southeast Asian and European experts showed rather similar views on the important drivers for bi-regional S&T cooperation between the two regions in 2020.

Only with regard to *mutual respect* as a driving force and the *tackling of global challenges*, the assessments differed, with European experts assigning more importance to both of these drivers.

With regard to a series of related drivers like *supporting less developed countries*, *identifying specific common problems of EU-SEA S&T cooperation*, *jointly formulate calls*, *jointly identify key research areas* and trust aspects ("Address issues which are of interest to ASEAN and not just of relevance to EU. Only then trust will be built"), participants from both regions find them equally important.



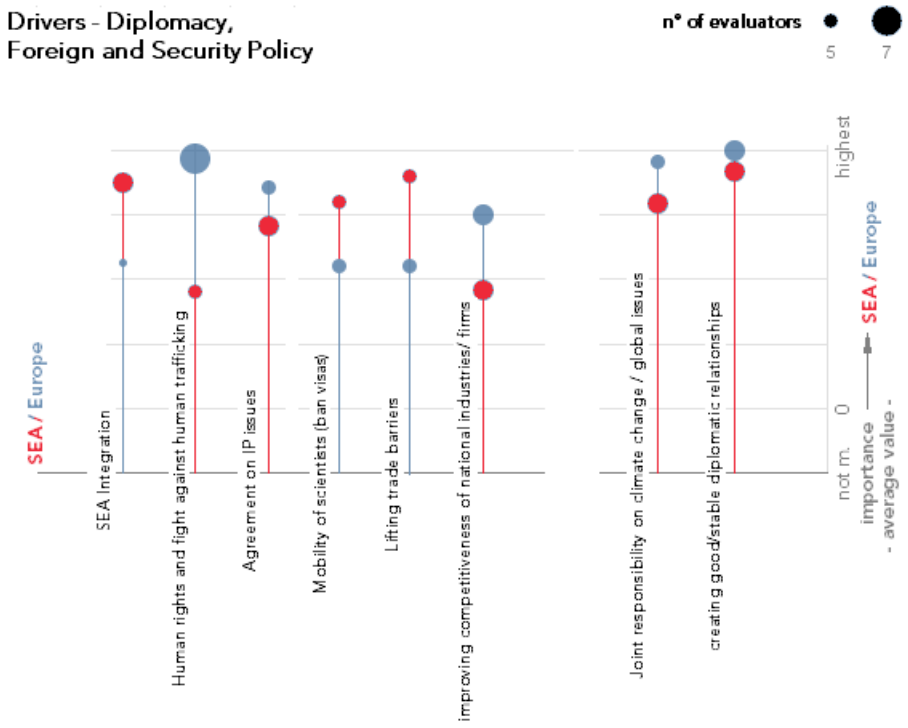
Diplomacy, Foreign and Security Policy

Finally, in the area of Diplomacy, Foreign and Security Policy, *creating good/stable diplomatic relationships* and a *joint responsibility on climate change / global issues* were regarded as highly relevant drivers for a successful future S&T cooperation scenario by experts from both regions.

Interestingly, particularly regarding the above mentioned views in Economic Policy, in the context of Foreign Policy, Southeast Asian experts considered *improving the competitiveness of national firms* a moderately relevant driver, while Europeans considered this aspect quite central. Southeast Asian participants, however, in contrast to their European colleagues, perceived the lifting of trade barriers a highly relevant driver, which is consistent with the results in the field of Trade and Economic Policy.

Considerable differences exist in the views on **Human Rights and the fight against human trafficking** as a relevant driver: 7 out of 9 European experts saw it as a totally crucial aspect (4,85 out of 5 points) while 5/7 SEA experts assign moderate relevance (2,8 out of 5 points). An agreement on intellectual property issues was considered slightly more important by European participants.

As above in the field of Science and Research Policy, SEA integration is seen as an important driver by SEA experts and as a moderately relevant one by Europeans. The question of scientists' mobility and, more concretely, with a banning of visas shows similar results: Southeast Asian experts consider it a more important driver.



Diverging views within regions

Besides examining consensus and diverging views on the importance of certain drivers between the two groups of regional experts, taking a look into the difference of views expressed within each region also promises to disclose meaningful insights.

In the case of Southeast Asian experts' answers, there were a series of driving forces considered by some as crucially important and by others as rather irrelevant. This is shown in the following table using each of the experts' grades given to the specific driver as well as the variance and average of the given points.

Policy area	**Driver**					
	Estimated Relevance Europe[52]			**Estimated Relevance for SEA**		
Higher Education Policy	Support for Co-Authored Papers (Co-Funding Schemes)					
	4, 4, 4, 3	s=0,25	Φ 3,75	**5, 3, 3, 2, 4**	s=1,3	Φ 3,4
	Internationalisation of Education					
	5, 5, 4, 4, 5	s=0,3	Φ 4,6	**1, 4, 4, 5, 4, 5**	s=2,2	Φ 3,83
Science and Research Policy	Diversification of partners					
	5, 5, 4, 3, 3	s=1	Φ 4	**5, 2, 1, 3, 2, 3, 3**	s=1,6	Φ 2,71
Industry, Trade and Economic Policy	Achieving science excellence in a globalised world					
	5, 5, 5, 5, 4, 5	s=0,17	Φ 4,83	**4, 4, 5, 2, 4**	s = 1,2	Φ 3,8
Development Policy / Global Challenges	Link DEV-Programmes stronger with S&T programmes					
	3, 4, 4, 4, 4	s=0,2	Φ 3,8	**4, 5, 2, 2, 4**	s = 1,8	Φ 3,4
	SEA integration					
	3, 2, 2, 4	s=0,92	Φ 2,75	**3, 4, 5, 2, 3**	s = 1,3	Φ 3,4
Diplomacy, Foreign Policy, Security Policy	Improving competitiveness of national industries/firms					
	5, 4, 5, 3, 4, 3	s=0,8	Φ 4	**1, 2, 2, 4, 5, 3**	s = 2,2	Φ 2,8
	Supporting less developed countries					
	3, 3, 3, 5, 2, 5	s = 1,5	Φ 3,5	**1, 3, 3, 3, 5, 4**	s = 1,8	Φ 3,2

s… variance
Φ… average

[52] Most important = 5; least important = 1

So, for example, Southeast Asian experts had no corresponding views among themselves to the question whether the support for co-authored papers would be relevant as a driving force for S&T cooperation between Southeast Asia and Europe.

Still in the area of Higher Education Policy, they disagreed even more about the possible role of an *internationalising education* for boosting bi-regional S&T cooperation. In case EU policy makers decide to address the goal of an intense bi-regional science and technology cooperation by addressing higher education and its rootedness in national university systems, this aspect might need clarification and further consultation with the Southeast Asian partners.

In Science and Research Policy, there was no consensus regarding the question whether a *diversification of partners* drives bi-regional S&T cooperation between Southeast Asia and the EU forward or not. The opinion of the experts regarding the possible driver "science excellence" not only varies among regions, but also within the group of Southeast Asian participants.

More interestingly, they expressed a great variety of views with regard to the role of *linking development programmes with S&T programmes* and of *supporting less developed countries*. This might partly be explained by the presence of a series of Southeast Asian countries that, due to their economic performance, do not receive any kind of development assistance.

This point expresses very well the diverse picture the Southeast Asian region presents. This will certainly be an issue for possible efforts to strengthen bi-regional S&T cooperation, as well, as was also expressed by workshop participants from both sides in the final discussion round.

In addition, views on the significance of *integration processes within Southeast Asia* for S&T cooperation with Europe also differed, although not as strongly as other issues. It might be wise to keep these different estimations of the role of SEA integration in mind when approaching the goal of a strengthened bi-regional S&T cooperation at the political level. When there is no consensus among Southeast Asian stakeholders that SEA integration is helpful in this account, it might be difficult to get substantial political support at regional Southeast Asian level.

The issue of the driver *supporting national industries* was already discussed above. Southeast Asian experts offered different opinions, here, and valued this driver less than similar economy-related issues. This might be explained by either/or a trust of Southeast Asian stakeholder in their economic landscape or by the experience that national industries are not that important for S&T endeavours.

In the case of the European group of experts[53], there was diversity with regard to a greater number of possible drivers:

[53] which was slightly bigger – 9 participants compared to the 7 SEA participants

Policy area	Driver					
	Estimated Relevance Europe[54]			Estimated Relevance for SEA[55]		
Higher Education Policy	Competition for scarce (human) resources					
	5, 3, 5, 1, 4	s = 2,8	Φ 3,6	3, 3, 4, 4, 4, 3, 4	s=0,3	Φ 3,57
	Diversification of partners					
	2, 4, 3, 5, 3, 3	s = 1,1	Φ 3,33	2, 3, 4, 4, 3, 3, 4	s=0,6	Φ 3,29
	Brain gain					
	5, 4, 4, 1, 3	s = 2,3	Φ 3,4	**3, 3, 2, 5**	s=1,6	Φ 3,25
Science and Research Policy	Competition for scarce (human) resources					
	1, 5, 3, 4, 4	s = 2,3	Φ 3,4	5, 4, 3, 3, 3, 4, 4	s=0,6	Φ 3,71
	Bi-regional "Science Days" (events)					
	5, 3, 2, 4, 4	s = 1,3	Φ 3,6	4, 3, 2, 2, 2, 2	s=0,7	Φ 2,5
Industry, Trade and Economic Policy	Competition for scarce (human) resources					
	3, 1, 5, 4, 5	s = 2,8	Φ 3,6	4, 3, 4, 4, 4	s=0,2	Φ 3,8
	Favourable policy background					
	2, 4, 3, 5, 4, 5	s = 1,4	Φ 3,83	5, 5, 5, 5, 5	s = 0	Φ 5
	"pro poor" approach					
	1, 5, 3, 3	s = 2,7	Φ 3	3, 5, 5, 3, 3	s = 1,2	Φ 3,8
Development Policy / Global Challenges	Support for research infrastructures					
	3, 5, 5, 1, 4	s = 2,8	Φ 3,6	4, 4, 3, 3, 2	s = 0,7	Φ 3,2
Diplomacy, Foreign Policy, Security Policy	Supporting less developed countries					
	3, 3, 3, 5, 2, 5	s = 1,5	Φ 3,5	**1, 3, 3, 3, 5, 4**	s = 1,8	Φ 3,2
	Mobility of scientists (ban visas)					
	3, 1, 4, 5, 3	s = 2,2	Φ 3,2	4, 3, 4, 5, 5	s = 0,7	Φ 4,2

s… variance
Φ… average

We don't want to pick out each single item, here, but extract some of the most interesting findings relevant for policy recommendations.

As can be seen, the competition for scarce (human) resources as a possible driver for bi-regional S&T cooperation provoked strongly different reactions among European participating experts in all three policy areas where this driver was indicatively raised for discussion. This suggests that not all European experts would expect increased bi-regional cooperation once Europe gets excellent Southeast Asian scientists to work in the EU.

Whether or not the organisation of bi-regional science days can help advance S&T cooperation was also an ambiguously evaluated issue. Accordingly, if such events should take place in the future, policy-makers, programme-owners and organisers cannot expect unanimous support from fellow stakeholders (probably neither from the scientific community).

Supporting less developed countries, supporting research infrastructures and adopting a "pro poor" approach are possible drivers that are very diversely reflected upon by the European participants. This indicates either that some European experts don't expect any impact of development assistance related S&T activities on bi-regional S&T cooperation or that some of them don't want to see these two fields connected.

Likewise, European experts did not agree upon the importance of mobility with the explicit hint to possibly banning visas for scientists. Either some of them expect that cooperation would not increase even if scientists from both regions can enter and leave the respective regions at any time, or they are not in favour of banning visas.

[54] Most important = 5; least important = 1
[55] Most important = 5; least important = 1

3.4 Shapers for SEA-EU S&T Cooperation 2020

In this section, we want to shortly highlight the most important shapers of the future of bi-regional S&T cooperation between Southeast Asia and Europe that were identified by the scenario workshop participants.

In methodological terms, as described in chapter 3.2, participants were once again asked to consider a list of indicatively shapers and add new ones. Subsequently, each expert could both vote the relevance of each of the shapers by distributing 10 relevance points over the whole set of shapers and add qualitative comments and further explanations.

A visual overview of the data gathered in this part of the exercise (without the qualitative comments) can be found in Annex 3.

The shaper that by far raised the biggest interest among experts in both regions was *focusing common R&D areas on Food, Energy and Water*. While this can also be understood as a driver, here it is also to be interpreted as a mentioning of the general relevance of food, energy and water issues in the region in the not-so-near future. A corresponding commentary of an expert justifying the impact of this shaper on Southeast Asia: "F, E, W are the main issues in ASEAN countries. Although there have been a lot of approaches and achievements […] still in the upcoming years (up to 2020), people in ASEAN […] are very concerned on these three issues". Similarly another expert: "It is important for ASEAN countries to have a regional food product or a regional proven technology for ensuring energy resources".

Another expert addressing the impact of this shaper on the EU recurs to another reading of this shaper: "[C]ommon R&D programmes will have an effect on the future EU scientific programmes". He/She means that, as more money will be allocated to research activities focusing these issues, this will shape the bi-regional S&T cooperation.

Related to this driver is the mentioning of *global issues*, *financial and environmental crises* and, also very prominently, *global challenges*. Here, the experts agree that global challenges "will affect [the] amount of R&D funding to support international collaboration", that these challenges could lead to competition for resources and conflicts. "CO2 will decide upon the 'language' of S&T cooperation". However, it is also highlighted that global challenges might turn into an opportunity for cooperation in a focused thematic approach – this reading suggest that if there is a pressing need, cooperation will function well bi-regionally.

According to the participants' views, *intellectual property issues* will shape the form of future bi-regional S&T cooperation between Southeast Asia and Europe. Weak IPR regimes could discourage international collaboration. IPR are said to be especially important for the EU – the reason for this appraisal might be that the stakeholders present in the workshop doubt that the European scientific community will share significant research efforts and outcomes without having the property rights clarified. Southeast Asian experts share the view of the opportunities included in IPR systems and state that the countries in the region will further develop the IPR culture. However, they also point to the adverse effects of an IPR system: these could lead to competition and impose barriers.

The *availability of technical and scientific skills* as well as existing *management capacities* is also mentioned as relevant context factors for bi-

regional S&T cooperation. The latter are considered essential for participation in EU-funded schemes. An expert opined that increased management capacities in Southeast Asia will lead to an increase in S&T absorption capacity which, in turn, increases cooperation with Europe. The former point of technical and scientific skills also has to be seen as relevant for S&T absorption capacity.

Interestingly, the *support to regional S&T institutions* in Southeast Asia is not considered to have a significant impact on SEA in terms of bi-regional S&T cooperation with Europe. On the other hand, European experts expressed the need for regional centres of excellence. We discuss this point in more detail in the recommendations section.

The development of common and harmonised planning, monitoring, evaluation and impact assessment methodologies was determined to be a crucial shaper for bi-regional S&T cooperation, specifically as regards Europe. Southeast Asian experts consider this point having much less impact and, thus, relevance in the SEA case.

For a visualisation of around 20 of the most important identified shapers with the points of relevance given to them by the workshop participants, please refer to Annex 3, part 2.

3.5 Analysis of the Drivers and Shapers

Before turning to the considerable number of policy recommendations that are implicit in the aforementioned views on drivers and shapers of a high-intensity bi-regional S&T cooperation between Southeast Asia and Europe, we will give a brief overview of these factors directly and indirectly influencing the future scenario.

The following points call for attention when adopting this point of view:

- There is a common concern for global challenges among both groups of experts which becomes apparent both in the identification of drivers and shapers

- The need for a support to research infrastructure and the related need for available technical and scientific skills were nominated important factors in terms of drivers and shapers. Regarding possible ways to address this issue (development assistance for S&T capacity-building, "pro poor" approach in S&T cooperation programmes, etc.), we observe a diverse picture. Further discussion and consultation processes would be needed and can serve, at the same time, networking and trust-building goals among the regions and stakeholder communities.

- Southeast Asian experts consider economic and trade factors as more important drivers for S&T cooperation than their European peers (while at the same time not insisting on the improvement of national firms' competitiveness as a central driving force.

- European participants, by comparison, were more concerned about the protection of intellectual property rights as a necessary precept for successful and far-reaching S&T cooperation.

- Southeast Asian experts are less concerned for the relevance of human rights in this context and, relatedly, are less convinced of the usefulness of taking into account subject areas like humanities in the bi-regional cooperation.

3.6 Recommendations

The discussion of a future success scenario in bi-regional high-intensity S&T cooperation between Southeast Asia and Europe and the identification, via backcasting, of drivers and shapers relevant to this scenario allows for extracting a rich series of policy recommendations for the case that decision-makers wish to adopt the success scenario as a goal and as an effectively orienting future planning tool. However, we would like to advert that these recommendations were derived from the specific scenario of region-to-region cooperation. They do not take into account the country perspective.

Due to the nature of the SEA-EU-NET project deliverable this document forms part of, the following recommendations are trimmed towards possible application by EU regional policy-makers. It is obvious that close cooperation with Southeast Asian and ASEAN policy makers is necessary in order to achieve a successful bi-regional cooperation scenario.

Joint Research Infrastructures and Policy Coordination

We have seen in the foregoing sections presenting the scenario workshop results that the support for research infrastructures was mentioned as a crucial driving force for future bi-regional S&T cooperation between Europe and Southeast Asia.

It is linked with a series of other driving forces, which can be combined in order to deduce a series of key policy recommendations. First, it is related to the less prominently, but still importantly considered driver of a connected S&T and development cooperation programming, S&T capacity-building and a "pro-poor" approach.

Thus, a first recommendation would be to assess possibilities of opening current or developing new development cooperation funds for science and technology capacity building. Connectedly, we recommend to conduct further consultations (involving the development assistance community stakeholders) to clarify how this issue can best be addressed (development assistance for S&T capacity-building, "pro poor" approach in S&T cooperation programmes, science-based development programmes, etc.). The consultations themselves can be the first trust-building steps towards bringing the stakeholder communities (and the regions) together.

Additionally, social impact assessment would strengthen the link between S&T and development programmes. This would, in turn, improve management capacities and the development of joint standards in other areas – two other drivers considered as important, the second one especially by European experts.

Besides augmenting the availability of technical and scientific skills (a prominently mentioned shaper of future research cooperation), development-relevant support to S&T research infrastructure could also mean that the subsequently possible research can address areas of joint interest like food, energy or water as well as global issues, which was mentioned as an important driver for bi-regional S&T cooperation in itself.

Finally, a connection of S&T and development funding would also do justice

to the diversification of partners in S&T cooperation highlighted as a relevant driving force for bi-regional cooperation scenarios in the field of higher education and, even more, science and research policy.

Inter-regional Joint Research Centres

The recommendations regarding the support to research infrastructure can be further concretised when looking at some additional drivers regarded as relevant by the experts.
The existence of regional centres of excellence and other regional S&T institutions in Southeast Asia was considered an important shaper for S&T cooperation between the regions by European experts, but not that much by Southeast Asian participants (as shown in chapter 4). This is interesting, as it suggests that SEA experts do not consider formalised/institutionalised inner-regional cooperation as a precondition for inter-regional cooperation. Nevertheless, support for research infrastructures and schemes for inter-regional joint usage of these infrastructures were highlighted as very important drivers by both sides (see sections on drivers in research policy and in development policy, above).
From a European Union point of view, we can thus deduce the recommendation to invest in and create **inter**-regional institutions rather than press for **inner**-regional S&T institution-building and afterwards connect **inner**-European with **inner**-Southeast Asian regional institutions.
Obviously, some kind of (political) institution-building is a precondition for the feasibility of the plan to install inter-regional S&T Excellence Centres in Southeast Asia. However, a possible and explicit political will from European side would certainly trigger effects in Southeast Asian regional S&T policy-making.

A different approach would be to set up region-country excellence centres between Europe and single Southeast Asian countries that could then serve as best-practice examples for other such centres or even motivate to raise these institutions to the regional level.
The creation of bi-regional S&T awards could serve as a preparatory step towards the setting-up of fully-fledged bi-regional Excellence Centres.

Mobility and Science Excellence

Several clear recommendations result from the importance allocated mutually by European and SEA experts to easy mobility as a driving force for bi-regional S&T cooperation:
Mobility schemes are both a necessary factor for successful bi-regional S&T cooperation and a measure that has already gained acceptance in both regions. Existing mobility schemes could be extended in terms of financial scope, content, level (scientists, PhDs...), funding partners, etc.; however the recognition of existing mobility schemes e.g. from the EC´s Framework Programme could be strengthened by more PR in the region. New bi-regional mobility schemes, e.g. in cooperation with ASEAN might as well be considered. **Easing visa regulations** for scientists' mobility was mentioned as another relevant and mobility-related driver by both sides. Interestingly, SEA experts were not so much concerned for brain drain/gain and brain circulation as drivers. Both were considered important, but less so than by European experts. For the EU's external higher education and research policy, this means that offering favourable (multiple) entry conditions is more important than working with SEA policy makers on return schemes for highly-skilled scientific community migrants. SEA

experts seem to trust in their societies' ability to capitalise on their scientific diasporas as well as from their resident scientist population.

Adopting measures to enhance mobility in both-directions and circularly promises to correlate with another factor identified as one of the most crucial drivers by both sides, especially the European: achieving science excellence. The fact that science excellence and mobility are inter-related and co-evolute gives the recommendation to offer enhanced mobility schemes even more weight: While, excellent scientists are more present on a world scale, are invited more often, etc., in order to be excellent in a given field, mobility certainly helps.

Supporting measures in this field of drivers could enter and enhance this spiral at three points, namely:

- by enhancing mobility in general (PR, PhD exchange, institutional exchange arrangements, visiting fellowships, etc.);
- by investing in teaching as well as research infrastructure in order to support the generation of future scientific excellence (this is also related with the idea of coordinating S&T cooperation policies with development cooperation programmes);
- and by a combined approach of enhancing mobility of excellent scientists (attractive visiting positions for Southeast Asian researchers in Europe, but also for European researchers in Southeast Asia)

These are "demand-side measures" – researchers are invited and expected to be mobile. The visa policy issues mentioned above could be complementary "supply-side measures", ensuring that researchers can also be mobile when they are not directly required by a specific demand-measure.

As an additional benefit of these or similar mobility measures, "network building", which was highlighted by experts from both regions as an important shaping factor, would be enhanced.

Joint Calls and Common Standards

A clear recommendation becoming visible in the scenario workshop data is the need for joint calls. The availability of joint calls would invite researchers to network more intensely. Researchers would increasingly get used to common standards and knowledge transfer could take place, in turn improving the performance in terms of scientific excellence on both sides. The calls would and probably should address R&D areas of common interest such as food, energy and water or other global issues. Joint calls that justify the labelling "bi-regional" would need corresponding regional funding from the Southeast Asian side. Here, the political level, especially foreign policy, becomes important as this point depends on the level of integration within ASEAN which in turn depends on the level of internal differences (in terms of research spending, etc.). The European counterpart would be easier, as the European Union already has a mechanism in place – the already existing Framework Programme.

Thus, the link to development policy, mentioned above in the recommendations on joint infrastructures, appears as crucial, again.

Throughout the scenario workshop, European experts have pressed much more for common and harmonised planning, monitoring, evaluation and impact assessment standards. If the EU wishes to get more active in standard setting in

Southeast Asia, much lobbying and awareness raising would be needed, particularly of the latent and sometimes apparent perception that e.g. the Framework Programme is "complicated". The opposite option would be to develop standards that are more flexible for cooperation with "third regions".
The development of joint calls could help a good deal in this dilemma, as it brings programme owners from both sides together with the concrete goal of setting up and committing to common standards.
The idea of joint calls would also have to take into account the following to sets of recommendations.

Innovation-driven research first

The outstanding prominence assigned to the goal of „maintaining a competitive edge in global innovation" as a driver for bi-regional S&T cooperation (in view of Science and Rearch Policy, Industry, Trade and Economic Policy) together with the fact that SEA experts considered attention to humanities and letters much less an important driver than their European colleagues advises to thematically focus S&T cooperation efforts, at least in a short-term perspective, to innovation-relevant applied and basic research. Another approach would be to raise awareness for the relevance of humanities and letters for e.g. accompanying and reflecting upon the social appropriateness and robustness of jointly developed innovations.

Thematic focus

In addition to the recommendation of starting to construct and amplify bi-regional cooperation in research fields proximate to innovation, an additional recommendation can be extracted from the scenario building results: Measures where jointly relevant and, especially, Southeast Asia relevant research issues are considered will be more likely to be accepted. Research areas like food, water, energy and other global issues influencing both regions will raise more interest on both sides.
Programme developers could benefit from this interest by getting feedback on the mechanisms offered, which can then be refined and thematically extended to research areas where scientists must already have trust in the cooperation mechanism in place (a specific project type, cooperation model, etc.) in order to endeavour getting active in bi-regional cooperation.

Flexible, but stable cooperation mechanisms

Financial crises and other external shocks (new or aggravated global challenges, etc.) were mentioned several times by experts from both regions as relevant shapers and, in concrete cases, also drivers (climate change research). Bi-regional cooperation mechanisms face a two-fold challenge, here:

- they must be stable enough to be trusted by the scientific community (e.g. a certain cooperation project model, once developed, should be available for a timeframe long enough to take into account researchers' planning horizons; the same goes, naturally, for new funding schemes e.g. in the field of mobility)
- and flexible enough to take into account the surrounding, e.g. newly emerging pressing thematic issues, financial or political instabilities, etc.

It is nevertheless recommendable that at a political level these issues are taken into account in order to generate trust among the

regions and establish stable networks, even more so as related studies carried out within the SEA-EU-NET project have shown that Southeast Asian researchers value a long-term commitment more than a short-term cooperation where, most often, the European scientists benefit more.

Coordination with Trade and Economic Policy

Particularly the Southeast Asian experts underlined how important they find economic and trade factors to be for successful bi-regional S&T cooperation.

A first recommendation taking into account this result could be to try to take into account research cooperation needs when designing foreign trade and economic policy. The free movement of capital is relevant for leveraging effective research funding, the free exchange of goods might be a precondition for sharing certain kinds of scientifically used or produced artefacts or biomaterials.

Annex 1 - SEA-EU-NET Project Information

Background

The SEA-EU-NET project has been set up to expand scientific collaboration between Europe and Southeast Asia in a strategic and coherent manner. The project was launched in January 2008 and involves 16 key institutions from the two regions. It adopts an evidence-based approach to increase the quality, quantity, profile and impact of Science and Technology (S & T) cooperation between the member countries of the Association of Southeast Asian Nations (ASEAN) and the member- and Associated States of the EU Seventh Framework Programme for Research and technological Development (FP7). This is in support of the international strategy of the EU, and in particular the specific objectives of the FP7 – the EU's primary funding opportunity for collaborative scientific research. The SEA-EU-NET project runs through to the end of 2011 although the outcomes will be designed so they are sustained beyond this point.

Description of work

Measures include the implementation of joint fora facilitating and strengthening the bi-regional and bi-lateral dialogue, activities to provide information on the EU FP7 in SEA, analysis of S & T structures and reporting to EU presidencies in order to incorporate recent political developments and to generally highlight EU-ASEAN initiatives within the political decision making process. The SEA-EU-NET will not only lead to enhanced S & T cooperation but will also provide the S & T base to address global challenges through joint efforts in nurturing human and scientific resources for sustainable development.

Objectives of SEA-EU-NET

(i) Dialogue: To strengthen bi-regional and bi-lateral dialogues in scientific cooperation and to assist the joint identification of topics for collaboration under FP7 thematic programmes.

(ii) Decision-Making: To report to the European Commission and the EU presidencies in order to incorporate recent political developments and to generally highlight EU-ASEAN initiatives within the political decision making process.

(iii) Networking: To network different stakeholders (such as universities, industry, government, civil society and donors) in order to strengthen research capacity.

(iv) Coherence: To facilitate the development and implementation of a coherent European level approach towards international S & T cooperation.

(v) Sustainability: All activities will be underpinned by a focus on sustainability and designed to deliver impact beyond the lifespan of the four-year project in order to develop long-lasting partnership.

To increase the efficiency, to avoid redundancies, and to ensure the sustainability of successful activities of the past and to learn lessons, the SEA-EUNET is considering all relevant previous and ongoing bi-regional and bi-lateral activities both inside and outside the EU Framework Programme for SEA. Moreover it will also function as a hub for the integration of upcoming FP7 projects and activities related to SEA, thus helping to incorporate them into the larger framework of the bi-regional dialogue.

SEA-EU-NET Partners

1. The International Bureau of the German Federal Ministry of Education and Research at the German Aerospace Center (PT-DLR), Germany (Coordinator) www.internationales-buero.de
2. The Royal Netherlands Academy of Arts and Sciences (KNAW), The Netherlands www.knaw.nl
3. The British High Commission, Singapore (BHC), Singapore and United Kingdom www.britishhighcommission.gov.uk/singapore
4. Collegium Budapest, Institute for Advanced Study (ColBud), Hungary www.colbud.hu
5. The Scientific & Technological Research Council of Turkey (TÜBITAK), Turkey www.tubitak.gov.tr
6. National Science and Technology Development Agency (NSTDA), Thailand www.nstda.or.th
7. Centre for Social Innovation (ZSI), Austria www.zsi.at
8. Ministry of State for Research and Technology (RISTEK), Indonesia www.ristek.go.id
9. National Centre for Scientific and Technological Information (NACESTI), Vietnam www.nacesti.vn
10. Institute of Asian Studies at the German Institute of Global Area Studies (GIGA), Germany www.giga-hamburg.de
11. Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD), France www.cirad.fr
12. The Royal Society (RS), United Kingdom www.royalsociety.org
13. Centre National de Recherche Scientifique (CNRS) – Réseau Asie, France www.reseau-asie.com
14. The Scientific & Technological Research Council of Turkey – UME (TÜBITAK UME), Turkey, www.ume.tubitak.gov.tr
15. Polska Akademia Nauk (PAN), Poland www.pan.pl
16. National Metrology Laboratory – SIRIM Berhad (NML-SIRIM), Malaysia www.sirim.my
17. Ministry of Science, Technology and Innovation (MOSTI), Malaysia www.mosti.gov.my

Coordination

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Heinrich-Konen-Strasse 1
53227 Bonn, Germany
Tel.: +49/(0)228/3821-437
Fax.: +49/(0)228/3821-444
E-mail: christoph.elineau@dlr.de

Annex 2 - Best Practice Guidelines for Participation in International Scientific Collaboration

1. Collaborative projects between the EU and SEA must have sustainable direct benefits to all participants. The benefit to researchers, institutions and society as a whole must be clearly defined and identifiable.

2. All partners must understand the scientific objectives of the potential collaboration before the project design is embarked upon.

3. All project partners and stakeholders should be included in the planning and design phase of the project as early as possible. Project partners must be fully engaged in the project.

4. Collaborative projects should be led by experienced and knowledgeable project managers (either European or South East Asian) who act as 'champions' for the project.

5. Projects should be well designed and both the managerial framework and decision making processes must be established in clear terms of reference. Indicative project costs should be clearly determined.

6. Cultural differences and differing socio-economic needs should be given due consideration in collaborative project design.

7. The project, including project partners, must be stable and sustainable. The value of continuity should be enforced in all projects.

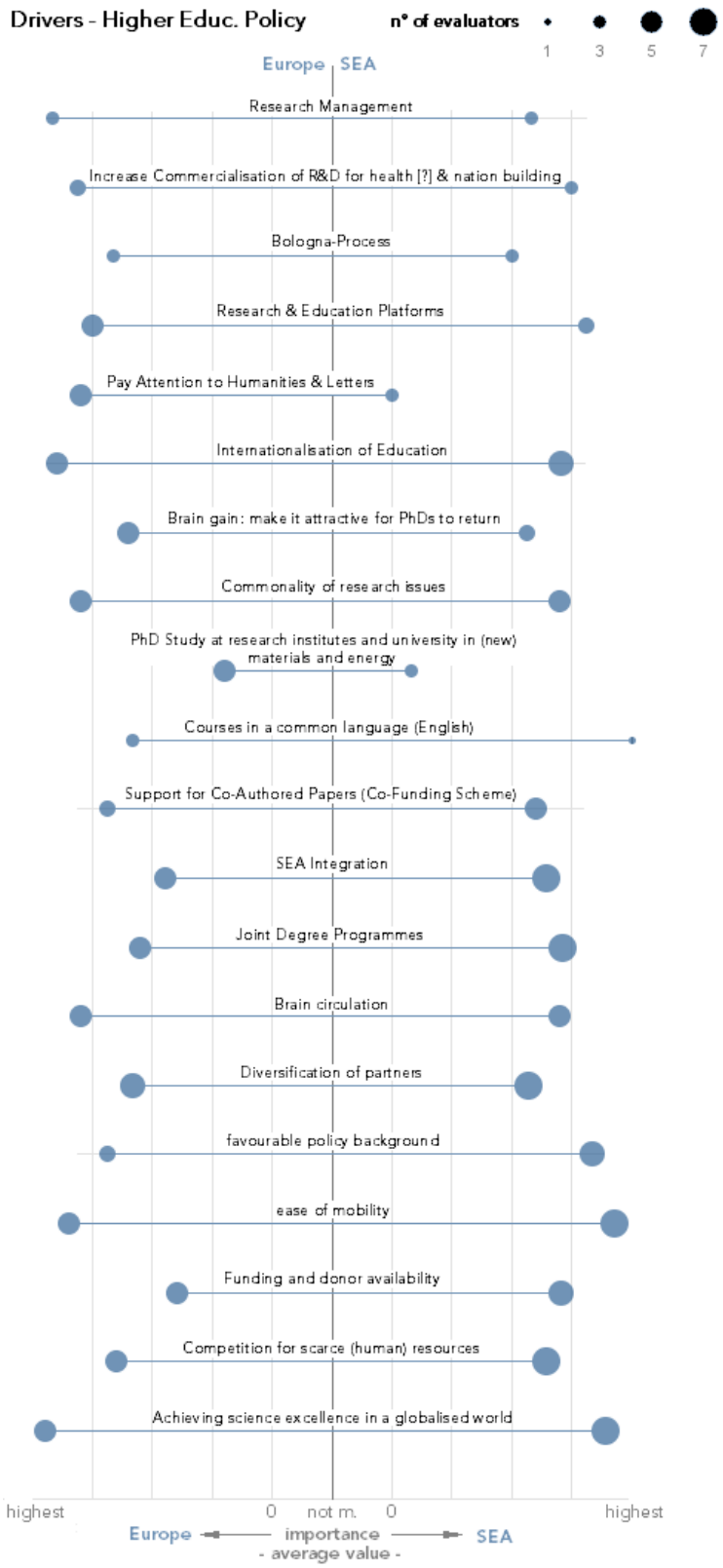
8. Full evaluation of all project outcomes must be included in the project design and mechanisms introduced to prevent any potential negative outcomes. (e.g. "Brain drain.")

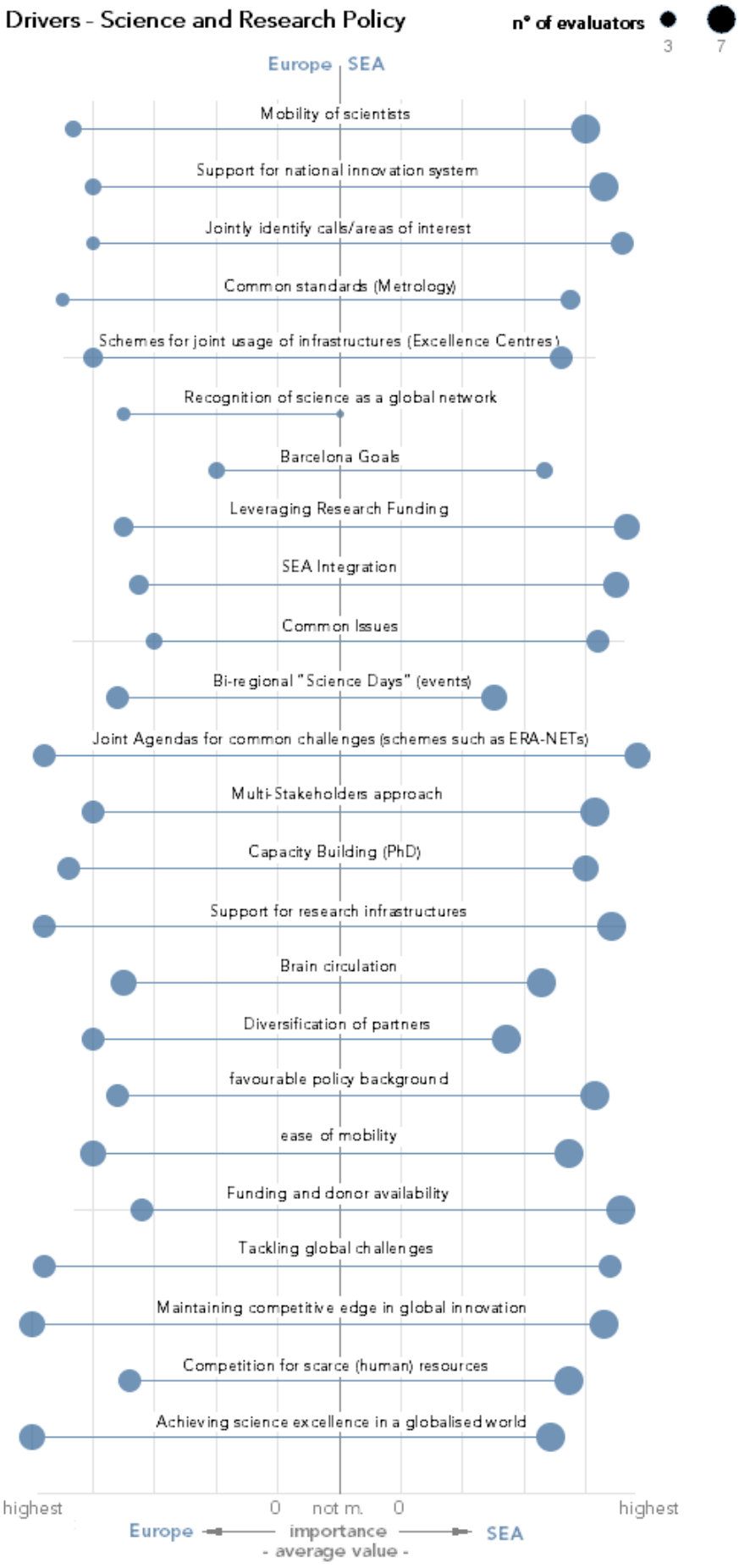
9. The project terms of reference should determine how the project outcomes will be allocated between partners including clarifying how intellectual property issues will be dealt.

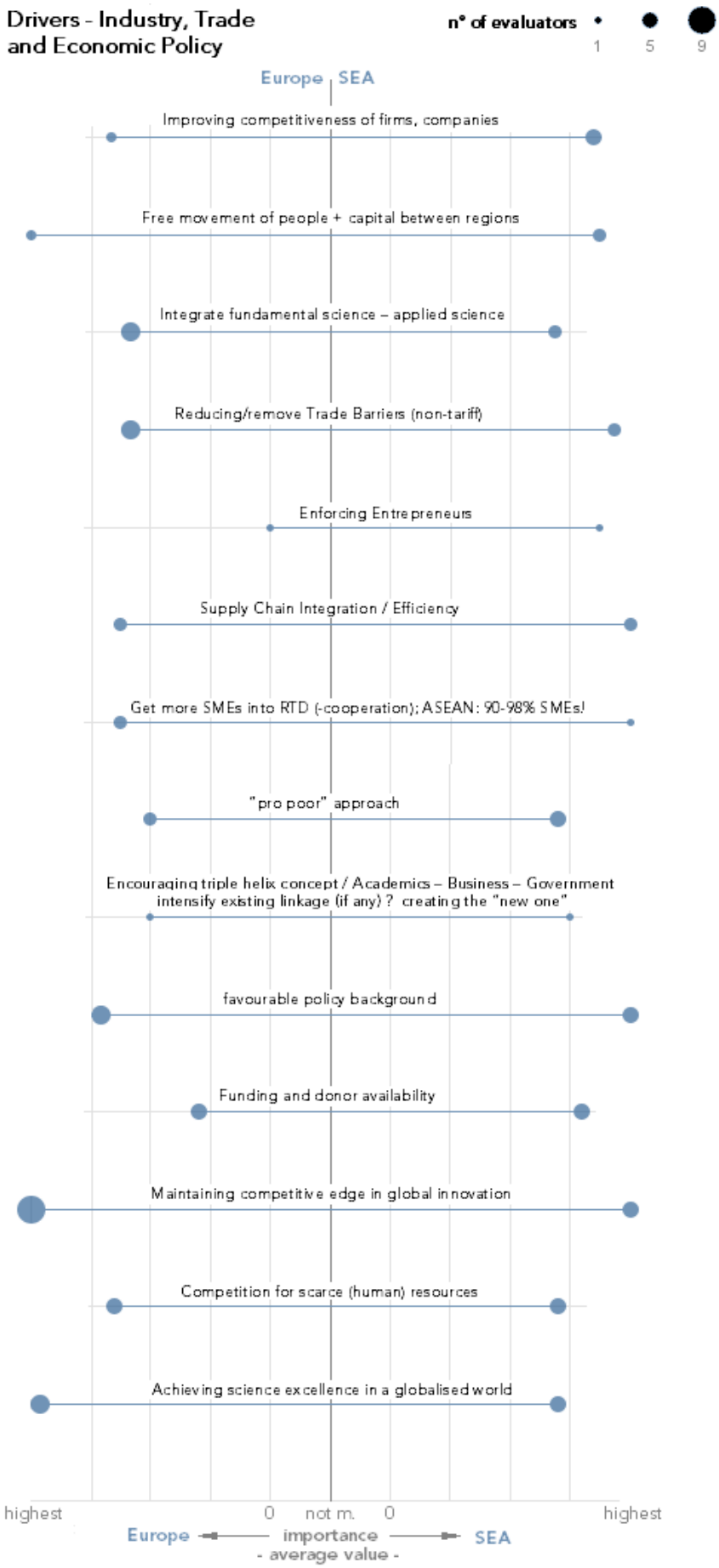
10. The participation of industry partners should be positively encouraged within projects.

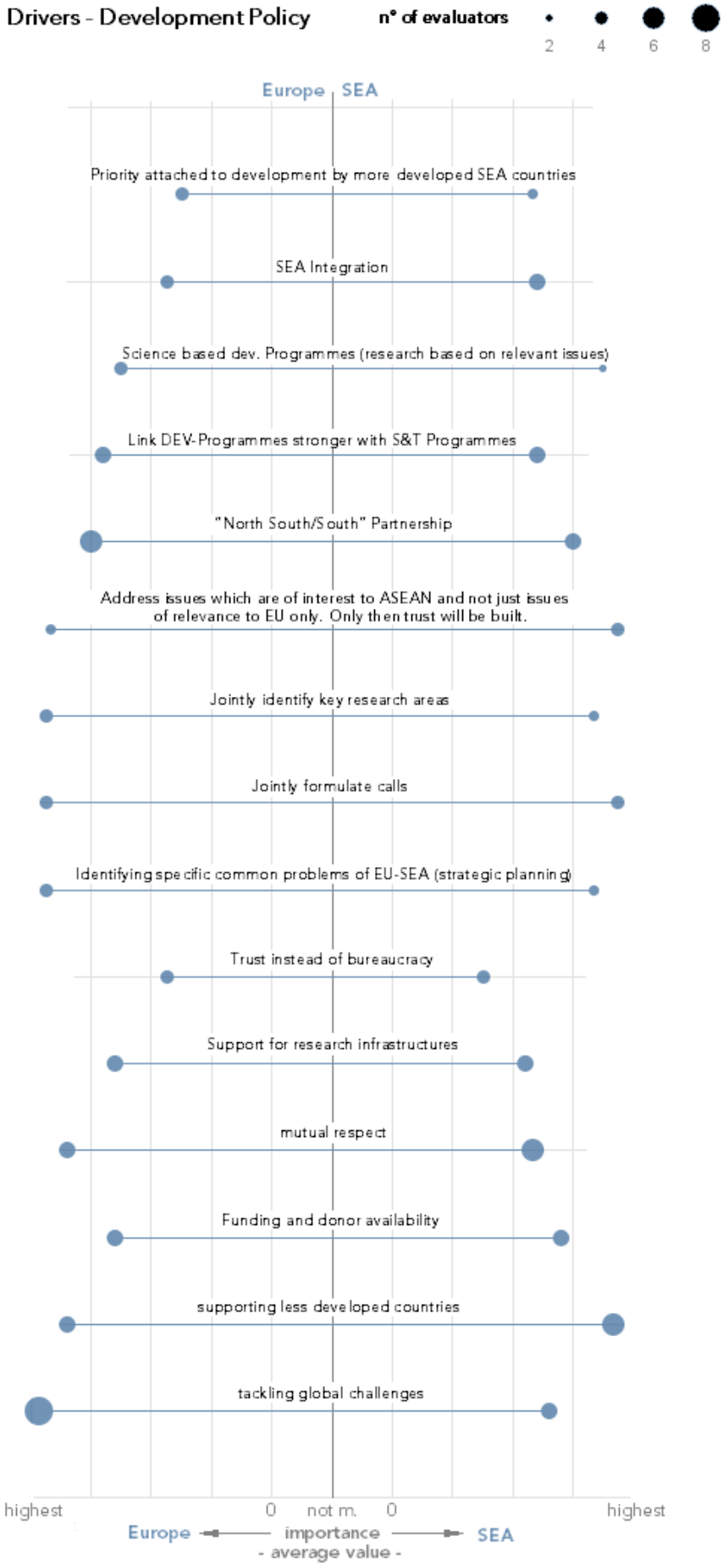
Annex 3 - Visualisations of Full List of Drivers and Shapers

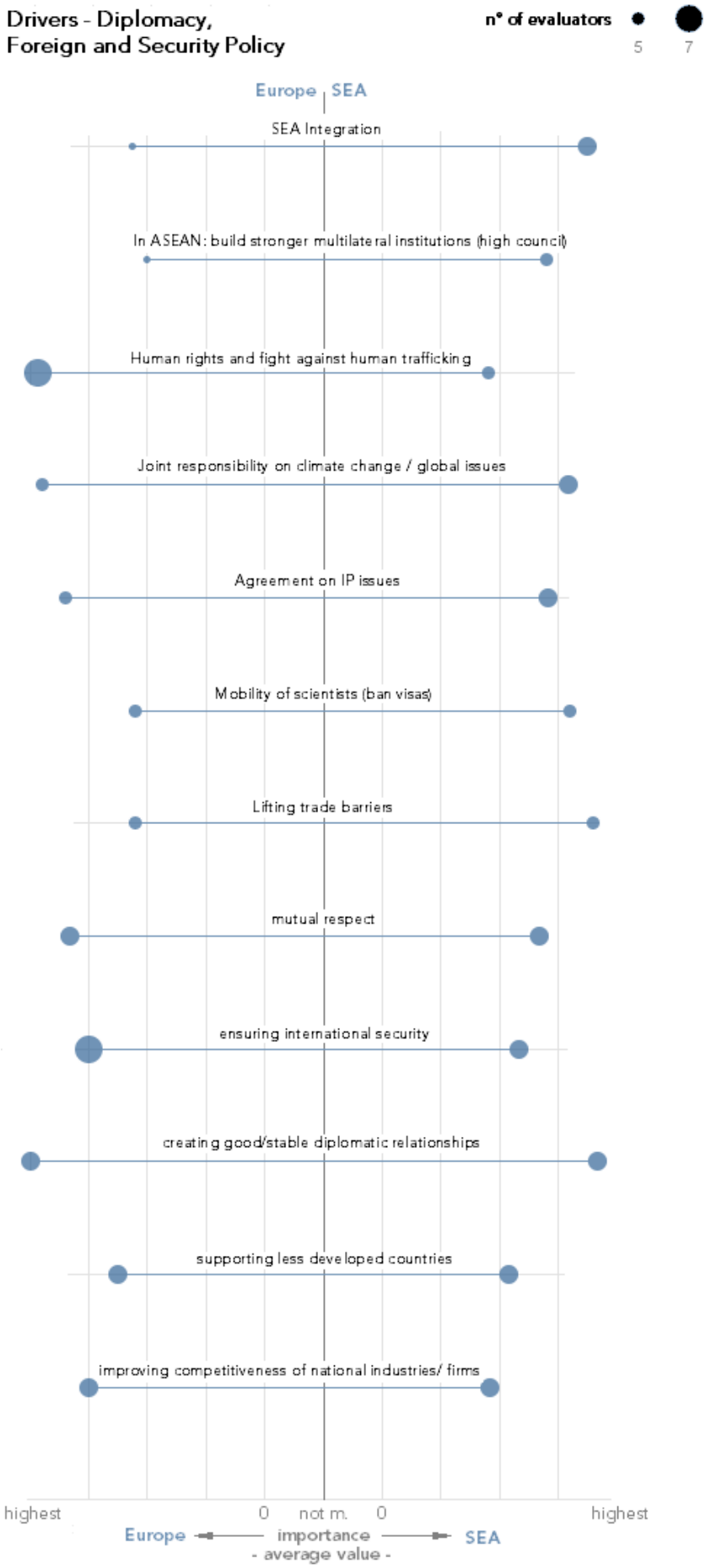
1. Drivers



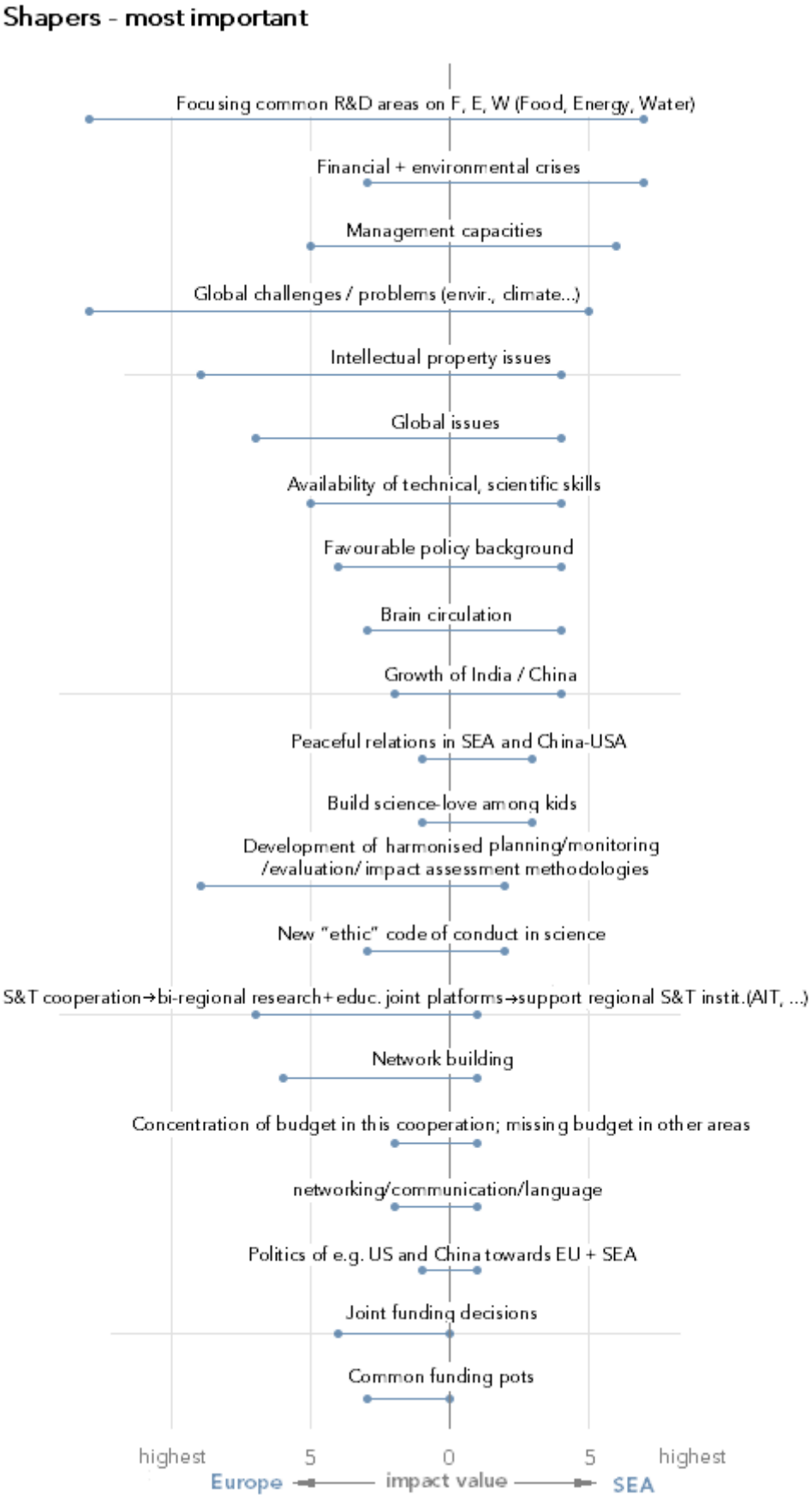

Drivers - Science and Research Policy
n° of evaluators
3
7
Europe
SEA
Mobility of scientists
Support for national innovation system
Jointly identify calls/areas of interest
Common standards (Metrology)
Schemes for joint usage of infrastructures (Excellence Centres)
Recognition of science as a global network
Barcelona Goals
Leveraging Research Funding
SEA Integration
Common Issues
Bi-regional "Science Days" (events)
Joint Agendas for common challenges (schemes such as ERA-NETs)
Multi-Stakeholders approach
Capacity Building (PhD)
Support for research infrastructures
Brain circulation
Diversification of partners
favourable policy background
ease of mobility
Funding and donor availability
Tackling global challenges
Maintaining competitive edge in global innovation
Competition for scarce (human) resources
Achieving science excellence in a globalised world
highest
0
not m.
0
highest
Europe
importance
SEA
- average value -


Drivers - Industry, Trade and Economic Policy
n° of evaluators
1
5
9
Europe
SEA
Improving competitiveness of firms, companies
Free movement of people + capital between regions
Integrate fundamental science – applied science
Reducing/remove Trade Barriers (non-tariff)
Enforcing Entrepreneurs
Supply Chain Integration / Efficiency
Get more SMEs into RTD (-cooperation); ASEAN: 90-98% SMEs!
"pro poor" approach
Encouraging triple helix concept / Academics – Business – Government intensify existing linkage (if any) ? creating the "new one"
favourable policy background
Funding and donor availability
Maintaining competitive edge in global innovation
Competition for scarce (human) resources
Achieving science excellence in a globalised world
highest
0
not m.
0
highest
Europe
importance
SEA
- average value -

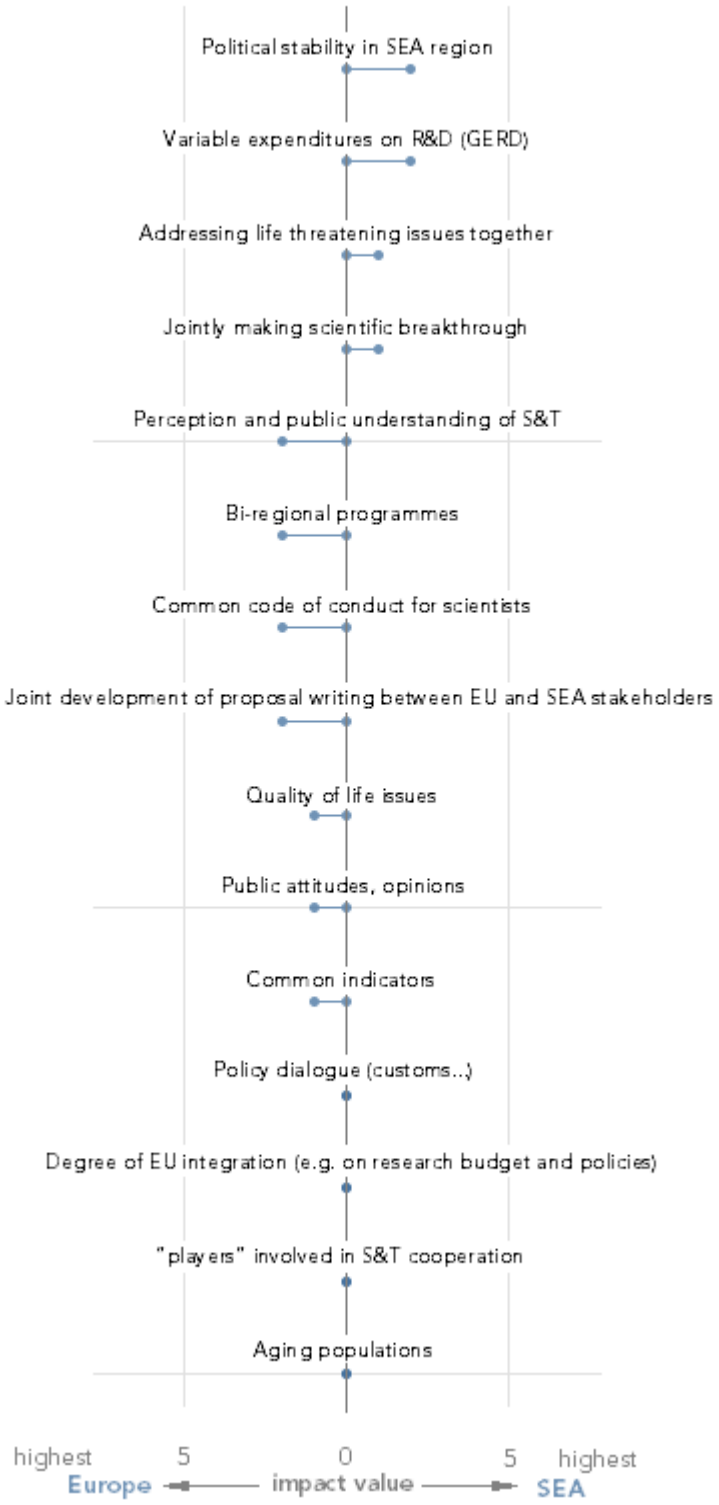

Drivers - Development Policy
n° of evaluators
2
4
6
8
Europe
SEA
Priority attached to development by more developed SEA countries
SEA Integration
Science based dev. Programmes (research based on relevant issues)
Link DEV-Programmes stronger with S&T Programmes
"North South/South" Partnership
Address issues which are of interest to ASEAN and not just issues of relevance to EU only. Only then trust will be built.
Jointly identify key research areas
Jointly formulate calls
Identifying specific common problems of EU-SEA (strategic planning)
Trust instead of bureaucracy
Support for research infrastructures
mutual respect
Funding and donor availability
supporting less developed countries
tackling global challenges
highest
0
not m.
0
highest
Europe
importance
SEA
- average value -


Drivers - Diplomacy,
Foreign and Security Policy
n° of evaluators
5
7
Europe
SEA
SEA Integration
In ASEAN: build stronger multilateral institutions (high council)
Human rights and fight against human trafficking
Joint responsibility on climate change / global issues
Agreement on IP issues
Mobility of scientists (ban visas)
Lifting trade barriers
mutual respect
ensuring international security
creating good/stable diplomatic relationships
supporting less developed countries
improving competitiveness of national industries/ firms
highest
0
not m.
0
highest
Europe
importance
SEA
- average value -

2. Shapers


Shapers - most important
Focusing common R&D areas on F, E, W (Food, Energy, Water)
Financial + environmental crises
Management capacities
Global challenges / problems (envir., climate...)
Intellectual property issues
Global issues
Availability of technical, scientific skills
Favourable policy background
Brain circulation
Growth of India / China
Peaceful relations in SEA and China-USA
Build science-love among kids
Development of harmonised planning/monitoring /evaluation/ impact assessment methodologies
New "ethic" code of conduct in science
S&T cooperation→bi-regional research+educ. joint platforms→support regional S&T instit.(AIT, ...)
Network building
Concentration of budget in this cooperation; missing budget in other areas
networking/communication/language
Politics of e.g. US and China towards EU + SEA
Joint funding decisions
Common funding pots
highest
5
0
5
highest
Europe
impact value
SEA

Shapers


Political stability in SEA region
Variable expenditures on R&D (GERD)
Addressing life threatening issues together
Jointly making scientific breakthrough
Perception and public understanding of S&T
Bi-regional programmes
Common code of conduct for scientists
Joint development of proposal writing between EU and SEA stakeholders
Quality of life issues
Public attitudes, opinions
Common indicators
Policy dialogue (customs..)
Degree of EU integration (e.g. on research budget and policies)
"players" involved in S&T cooperation
Aging populations
highest
5
0
5
highest
Europe
impact value
SEA

Annex 4 - List of Interview Partners and Workshop Participants

1. Modified SWOT Analysis

Workshop and interviews in Southeast Asia

Brunai Darussalam			
Institution	**Name**	**Position/Expertise**	Additional Position/Expertise
Department of Agriculture, Ministery of Industry and Primary Resources	Roainah Bt. Hj. Abdul Rahman	AgriFood Industry Consultation & Investment	ASEAN COST SCFST
University of Brunei Darussalam, Department of Biology	Zohrah Hj Sulaiman	Dean of Science and Senior Lecturer	ASEAN COST ABAPAST

Cambodia			
Institution	**Name**	**Position/Expertise**	Additional Position/Expertise
Department of International Cooperation	Ieng Sreng	Director of International Communnications	ASEAN COST SCMIT
Ministry of Agriculture, Forestry and Fisheries	Neou Kompheak	Vice Chief of Agriculture ASEAN Office	ASEAN COST SCB
Ministry of Commerce, Consumer Protection and Anti-Fraud Camcontrol General Department	Sameng Muny	Deputy Director	ASEAN COST SCFST
Ministry of Education, Youth and Sports	Phoeurng Sackona	Secretary of State	ASEAN COST SC SCIRD

Indonesia			
Institution	**Name**	**Position/Expertise**	Additional Position/Expertise
Indonesian Institute of Sciences (LIPI)	Masbah Rotuanta Tagore Siregar	Deputy for Engineering Sciences	ASEAN COST SCMST
Indonesian Institute of Sciences (LIPI)	Bambang Prasetya	Head of Biotechnology Division	ASEAN COST SCB
Indonesian Institute of Sciences (LIPI), Centre for Chemical Research	Leonardus Brotu Sugeng Kardono	Director	ASEAN COST SCFST
National Institute of Aeronautics and Space (LAPAN)	Leo Rijadi	Researcher	ASEAN COST SCOSA

National Institute of Aeronautics and Space (LAPAN)	Muchamad Muchlis	Head planning, cooperation and finance	ASEAN COST SCOSA

Laos			
Institution	**Name**	**Position/Expertise**	Additional Position/Expertise
Ministry of Public Health	Sivilay Naphayvong	Director of Food and Drug Division	ASEAN COST SCFST
Science Technology and Environment Agency, General Technology Research Institute	Keophayvanh Insixiengmay	Acting Director	ASEAN COST SCNCER
National University of Laos, Faculty of Architecture	Manorot Phinith	Vice Dean for Academic Affairs	ASEAN COST SCMST
Science Technology and Environment Agency, Environment Research Institute	Virany Sengtianthr	Deputy head environment data center	
Science Technology and Environment Agency, Research Institute of Science	Sourioudung Sundara	Director-General	ASEAN COST SCB

Malaysia			
Institution	**Name**	**Position/Expertise**	Additional Position/Expertise
Advanced Materials Research Center (AMREC)	Azmi Idris	Senior General Manager	ASEAN COST SCMST
SIRIM Berhad	Hamdan Mokhtar	Programme Head Energy and Process Engineering Group	ASEAN COST SCNCER

Philippines			
Institution	**Name**	**Position/Expertise**	Additional Position/Expertise
Philippines Council for Industry and Energy Research and Development	Nonilo A. Pena	Supervising Science Research Specialist	ASEAN COST SCNCER
Advanced Science and Technology Institute	Denis F. Villorente	Director	ASEAN COST SCMIT
OUSEC for Research & Development (ITCU)	Gian Carlo Bongalon		(ASEAN COST ABAPAST)

Thailand

Institution	Name	Position/Expertise	Additional Position/Expertise
Ministry of Natural Resource and Environment, Phuket Marine Biological Center	Wannakiat Thubthimsang	Director	ASEAN COST SCMSAT
National Metal and Materials Technology Center (MTEC)	Krisda Suchiva	Deputy Director	ASEAN COST SCMST

Vietnam			
Institution	**Name**	**Position/Expertise**	Additional Position/Expertise
National Centre for Science and Technical Information	Le Xuan Dinh	Deputy chief of department	
Vietnamese Academy of Science and Technology, Institute of Biotechnology	Le Tran Binh	Director	ASEAN COST SCB
Vietnamese Academy of Science and Technology (VAST)	Bui Cong Que	Director Planning and Finance Department	
Vietnamese Academy of Science and Technology, Institute of Information Technology	Thai Quang Vinh	Associate professor, deputy director	(ASEAN COST SCMIT)

Singapore			
Institution	**Name**	**Position/Expertise**	Additional Position/Expertise
Nanyang Technological University, School of Material Science & Engineering	Oh Joo Tien	Associate professor Ni-based nanostructured magnetic material	ASEAN COST SCMST

Workshop and interviews in Europe

Austria			
Institution	**Name**	**Position/Expertise**	Additional Position/Expertise
Vienna University of Technology	A Min Tjoa	Professor, Director Institute of Software Technology	Coordinator ASEA Uninet

France

Institution	Name	Position/Expertise	Additional Position/Expertise
University Paris-Dauphine	Anne de Blignières	Professor	Vocational training systems
Ecole Normale Supérieure de Cachan	Bogdana Savu-Neuville	Head International Affairs	
Sigma Orionis (ICT company)	Camille Torrenti	Project manager	Project manager SEACOOP (FP7)

Germany			
Institution	**Name**	**Position/Expertise**	Additional Position/Expertise
German Academic Exchange Service (DAAD)	Hannelore Bossmann	Head of section South and Southeast Asia	
Kewog Städtebau (consultancy and engineering company)	Daniel Caspari	project manager consulting and international projects)	Project manager SETatWORK (FP 7)
TTZ Bremerhaven (company in food technology, bio process engineering, water, energy and land use management)	Barbara De Mena	Manager international cooperation projects	Project manager ISSOWAMA (FP 7)

Netherlands			
Institution	**Name**	**Position/Expertise**	Additional Position/Expertise
Wageningen University and Research Centre, Environmental Sciences Group/Alterra	Wim van Driel	Program director International Development	
Wageningen University and Research Centre, Plant Research International	Huub Löffler	Research programme developer	
UNESCO-IHE Institute for Water Education	Bart Schultz	Professor Land and Water Development	Advisor for Netherlands Ministry of Traffic and Waterworks

United Kingdom			
Institution	**Name**	**Position/Expertise**	Additional Position/Expertise
University of Edinburgh	John Fazakerley	Professor of virology	
London School of Hygiene and Tropical Medicine	Nigel Hill	Medical entomologist and head of Disease Control & Vector Biology Unit	

United States			
Institution	**Name**	**Position/Expertise**	Additional Position/Expertise
National Science Foundation, Office of International Science and Engineering (OISE)	Graham Harrison	Program Officer	

Turkey			
Institution	**Name**	**Position/Expertise**	Additional Position/Expertise
Istanbul Technical University	Selahattin Incecik	Professor of Atmospheric Science	Participant in Megapoli (FP 7)

2. Foresight Exercise – Scenario Workshop

Country	**Name**	**Institution**	**Region**
UK	James Screen	British High Commission, Singapore	EU
Germany	Andreas Klein	German Embassy in Jakarta	EU
Thailand	Simon Grimley	NSTDA	SEA
France	Maurice Siveton	French Embassy in Bangkok	EU
Malaysia	Prof. Dato`Shariff	UPM	SEA
Austria	Stephan Neuhäuser	BMWF	EU
Poland	Wladyslaw Wlosinski	POLISH ACADEMY OF SCIENCES	EU
[regional representat.]	Dawood Ghaznawi	Greater Mekong Subregion Environment Operation Center	SEA
Hungary	Sándor Szigeti	NKTH	EU
The Netherlands	Rudie Trienes	KNAW	EU
Indonesia	Nada Marsudi	RISTEK	SEA
[regional representat.]	Zulkefli Nani	WAITRO	SEA
Turkey	Burcak Cullu	TÜBITAK	EU AC
Vietnam	Luong Van Thang	MOST	SEA
Vietnam	Cao Minh Kiem	NACESTI	SEA
France	Christian Hoste	CIRAD	EU

Annex 5 - Abbreviations

AADCP	ASEAN–Australia Development Cooperation Program
ACP	ASEAN Cooperation Plan
ADB	Asian Development Bank
AIT	Asian Institute of Technology
APEC	Asia-Pacific Economic Cooperation
APRU	Association of Pacific Rim Universities
ASEAN	Association of Southeast Asian Nations
ASEAN COST	ASEAN Committee on Science and Technology
ASEAN Uninet	ASEAN-European University Network
A*STAR	Agency for Science, Technology and Research
BAKOSURTANAL	National Coordination Agency for Surveys and Mapping
BHC	British High Commission
BOPP	Best Opportunities and Possible Pitfalls
CORDIS	Community Research and Development Information Service
COST	Committee on Science and Technology
EC	European Commisstion
EU	European Union
FP	Framework Program
GDP	Gross Domectic Product
GERD	Gross Expenditure on R&D
GNI	Gross National Income
GRI	Government research institutes
ICT	Information and Communications Technology
INCO-NET	International Cooperation Network (EU funded international S&T cooperation project type with a focus on policy-dialogue)
IPR	Intellectual Property Rights
IRRI	International Rice Research Institute
IT	Information Technology
KNAW	Royal Netherlands Academy of Arts and Sciences
LAPAN	Nat. Institute of Aeronautics and Space
MNC	Multi National Corporation
MoU	Memorandum of Understanding
NCP	National Contact Point
NIS	National System of Innovation
NRC	National Research Council
NZ	New Zealand
OECD	Organisation for Economic Cooperation and Development
ODA	Official Development Assistance
RCE	Research Centres of Excellence
R&D	Research & Development
RRC	Regional Research Council
RSET	Researchers, scientist, Engineers and Technopreneur
S&T	Sciences & Technology
SEA	South-East Asia
SEA-EU-NET	South-East Asia INCO-NET
SME	Small and Medium sized Enterprise
S&T	Science & Technology
STI	Science and Technology through Innovation
SWOT	Strengths, Weaknesses, Opportunities, and Treats
TNC	Transnational Company
UK	United Kingdom
UNDP	United Nations Development Plan
UNESCO	United Nations Educational Scientific and Cultural Organization
UNIDO	United Nations Industrial Development Organization
US	United States
WHO	World Health Organisation
WTO	World Trade Organisation
ZSI	Centre for Social Innovation