

SEA-EU-NET: Jointly tackling global challenges

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Profile

Southeast Asia is a region which has been central to international travel and trade since the 12th Century as merchants looked for alternatives to the Silk Road. As a result, the region is one of the greatest melting pots of culture and innovation. European countries have had deep historical links in scientific collaboration here, from Charles Darwin’s travels to Indonesia to Beri-beri research by Dutch scientist, Christiaan Eijkman. Europe has consistently been one of the most significant partners in scientific collaboration with the region. However, most of this collaboration has been bilateral, and has rarely engaged across national borders in both regions.

With globalisation, it has become more apparent that scientific collaboration requires more streamlined approaches with multilateral actors. The SEA-EU-NET project was formed in response to a need for a more strategic and coherent approach to EU-ASEAN scientific cooperation. The project has involved 21 institutional partners across the two regions from a variety of backgrounds including government, academia, private companies, and research institutes.

SEA-EU-NET – Facilitating the bi-regional EU-ASEAN Science and Technology dialogue

The first phase of the project supports the internationalisation policy of the EU and the specific objectives of FP7, and also contributes to building the science and technology (S&T) foundation essential to the EU achieving its political, economic and social objectives.

The project has achieved considerable impact in the following areas:

- Establishing a **bi-regional dialogue** between EU and ASEAN S&T policy makers at the Senior Officials level
- Raising the **profile of FP7** amongst the Southeast Asian research community as well as **increasing the level of Southeast Asian participation** in the FP7 programme
- Completing detailed **analytical work on the current state of EU-ASEAN S&T relations**, and developing recommendations on how to strengthen the relationship and feeding these into the official dialogue process, whilst also extending the dialogue on EU-SEA S&T cooperation to include a wider range of stakeholders
- Linking the project outcomes to other existing and upcoming ERA-, INCO-NET, and thematic EU-FP projects, thus also **facilitating the development of a coherent European-level approach towards international S&T cooperation**.

SEA-EU-NET 2 – EU-ASEAN S&T cooperation to jointly tackle societal challenges

Following the success of the first project, **SEA-EU-NET 2** was funded to increase scientific collaboration between Europe and Southeast Asia (SEA) in a more strategic and coherent manner.

- Continuing and intensifying the **bi-regional dialogue** between EU and ASEAN S&T policy makers on Senior Officials level as well as creating an **annual exchange forum** for researchers, innovation stakeholders, policy makers and private business to improve EU-SEA cooperation and exchange through the series of the **ASEAN-EU Science, Technology and Innovation Days**
- Jointly tackling societal challenges in the fields of **Health, Food Security and Safety, Metrology** as well as **Water Management** by organising events, providing fellowships for SEA researchers and conducting studies on future collaboration potential
- Initiating a dialogue on a common bi-regional **funding scheme** to enhance cooperation between these two regions, involving representatives from European and Southeast Asian funding agencies as well as from the ASEAN Secretariat and the European Commission.
- Informing the Southeast Asian research community about the Horizon 2020 programme, and increasing the level of Southeast Asian **participation in Horizon 2020**
- Completing detailed **analytical work** on the current state of EU-ASEAN S&T relations and innovation potential, and developing recommendations on how to strengthen the relationship and feeding these into the official dialogue process
- Extending the **dialogue** on EU-SEA S&T cooperation to include a wider range of stakeholders by connecting to already existing **networks** and dialogues



Figure 1: Workshop in STI Days 2015

Platforms

ASEAN-EU Year of Science, Technology and Innovation 2012

The creation of platforms for exchange on S&T between ASEAN and the EU has been one of the priorities of the SEA-EU-NET project. The inaugural ASEAN-EU Year of Science, Technology and Innovation 2012 (YoSTI 2012) was launched as a series of events throughout 2012. The year-long campaign involved more than 50 events in thirteen different countries, with more than 40 different institutions, including direct involvement from the European Commission, EU Delegations and ASEAN Committee on Science and Technology (ASEAN COST)¹ etc.

It increased the visibility of EU STI cooperation with ASEAN and contributed to focusing and strengthening cooperation on selected areas of mutual interest (ie. food security, green technologies) between the two regions at a bilateral and bi-regional levels.

The closing event of YoSTI 2012 took place on Wednesday 12 December 2012 in Brussels. The event, attended by over 140 participants. The overall objective of the event was to take stock of the achievements of the 'Year' and to discuss next steps in the inter-regional dialogue on research and innovation cooperation. A large delegation of the ASEAN COST came to Brussels on this occasion.

STI Days 2014-2016

Following on from the successes of YoSTI, SEA-EU-NET 2 created an annual platform event to highlight and promote areas of collaboration between ASEAN and the EU. It was aimed at bringing together ongoing initiatives and projects in EU-ASEAN S&T cooperation. This annual series of events are known as the **ASEAN-EU Science, Technology and Innovation Days (STI Days)**.

¹ ASEAN COST Members are generally the highest ranking administrative officer in charge of international cooperation in science and technology in the respective ASEAN Member Countries.

ASEAN-EU STI Days 2014



The flagship STI Days was held in Thai Science Park, home to NSTDA. The programme featured the official launch of Horizon 2020 in Southeast Asia, and a number of scientific workshops in the fields of health/infectious diseases, food safety, water management, material sciences, ICT, innovation, IPR issues, metrology etc.

The event welcomed 550 participants, including representatives of research and innovation policy, funding agencies as well as public and private research organizations. 66% participants were from Southeast Asia, while 34% were from EU countries. A feedback survey found that the STI Days was very positively received, with the networking and learning aspects of the event being ranked highly among the personal outcomes of the participants.

Participants were joined by high level representatives from both regions. In her opening address, Cristina Russo, Director for International Cooperation, DG Research and Innovation emphasised the importance the EU placed on partnerships with ASEAN. In this respect, the European Union (EU) has doubled its science funding for ASEAN nations under the Horizon 2020 programme with a budget of €80 million.

ASEAN-EU STI Days 2015



The second ASEAN-EU STI Days was held in the Science and Industry Museum in La Villette, a unique complex in which science and arts merge among a blend of nature and architecture. Organised by the Centre National de la Recherche Scientifique (CNRS), participants from

the EU, Southeast Asia and the rest of the world rubbed shoulders and exchanged views on various global societal challenges.

Key highlights include plenary sessions and key-note speeches from official representatives, high-level experts and top-scientists. Throughout the three days, scientific workshops and expert sessions were organised, focusing on three societal challenges of common interest for both regions: Health, Water Management as well as Food Security and Safety. A Brokerage Event connected to the main scientific topics of the STI days, also facilitated the matchmaking of scientists coming from both regions.

Field trips to major research and innovation facilities around Paris showed researchers in action at the Pasteur Institute, the National Agency for Research on AIDS and Hepatitis, Eau de Paris, and other locations.

ASEAN-EU STI Days 2016



The third iteration of the ASEAN-EU STI Days was held in Hanoi, Vietnam, from 10 to 12 May, 2016. The event was focused on presenting academic/industry collaborations in and between ASEAN and the EU in the context of common key societal challenges for both regions. The scientific workshops and expert sessions covered a wide range of topics—like antimicrobial resistance, water-food-energy nexus, metrology, the ASEAN Economic Community and innovation.

The STI Days 2016 saw the largest turnout to date, with up to 700 participants from a range of stakeholder groups including policy makers, company representatives, researchers and research administrators, from both regions. Other side events included a Brokerage Event, field visits to major research and innovation organisations in and around Hanoi, as well as a paper and poster competition.

ASEAN-EU Research and Innovation Co-operation Exhibition 2014-2016

One of the key activities during the STI Days was the SPI organised “Showcase of ASEAN-EU Research and Innovation Co-operation”, which acted as a platform to demonstrate interesting and fruitful projects on ASEAN-EU bi-regional research and innovation cooperation as well as to facilitate opportunities for future co-operation.

The aim of the exhibition was to allow innovative companies that have benefited from, or are interested in ASEAN-EU cooperation to showcase their innovation and technology offers; to create a platform for cross-regional dialogue and networking opportunities among exhibitors and other participants in the STI days,

to facilitate constructive discussions between the public and private sectors in STI bi-regional cooperation; and to showcase potential of ASEAN research capacities and its relevance to Europe.



Figure 2: Exhibition in STI Days 2015

The number of exhibiting organizations grew from year to year. The first edition of the STI Days in 2014 saw 14 exhibiting organizations coming from 7 different countries. In 2015, this number rose to 19 exhibiting countries from 13 different countries. The most recent STI Days held in 2016 had 27 booths from a total of 24 exhibiting organizations representing 11 countries. These exhibitors had the opportunity to show their projects and research to the public, thus creating an enabling and stimulating environment for the exchange of knowledge, experiences and networking opportunities. The target audience of the exhibition was mainly universities, research institutes, incubators and start-ups, private companies and businesses and public organizations and was attended by approximately 300-500 people every year.

For more information, please access the following website: <http://www.stidays.net/exhibition/>

People

National Contact Points (NCP)

One of the key resources created by the project is a network National Contact Points (NCP) in South East Asia. They serve as the main provider of advice and individual assistance in all EU Member States and Associated States when it comes to Research Funding from programmes across the EU.

Within projects like SEA-EU-NET, NCPs have also been established in many other countries worldwide. Seven out of ten ASEAN countries now have at least one NCP. As the NCPs are national structures, the type and level of services offered may differ from country to country. In general, the following basic services will be available from a NCP:

- Guidance on choosing thematic priorities and instruments
- Advice on administrative procedures and contractual issues
- Training and assistance on proposal writing
- Distribution of documentation (forms, guidelines, manuals etc.)
- Assistance in partner search

<https://sea-eu.net/object/document/161>

Alumni network

Southeast Asian alumni of EU educational and research organisations are a natural resource and ally to build and promote S&T cooperation between the two regions. Building on their knowledge of European research as well as their intercultural experience and potential influence in Southeast Asian national innovation systems, SEA alumni can play a vital role in initiating and accelerating bi-regional cooperation efforts. Moreover, alumni groups are predominantly organised on a country level—which offers opportunities to create regional SEA

linkages around specific thematic fields. Thereby alumni networks will play an increasing role in promoting a broader bi-regional scientific exchange and research cooperation.

The creation and maintenance of an alumni network is also useful to leverage the efforts of existing national initiatives seeking to strengthen alumni ties with Europe such as Thailand’s Reverse Brain Drain Project and a Vietnamese initiative to build up a database of EU Alumni. As such, a report on current status of EU alumni groups in SEA that identifies their research collaboration potential and in EU-SEA S&T cooperation has been disseminated to all partners.

Three alumni group meetings have been held which have been attended by European alumni in Southeast Asia and vice versa. To create partnership with key alumni groups as well as engage with alumni groups to support specific activities, the SEA-EU Alumni Network Database and SEA-EU Alumni Network Facebook page have been operational. Meanwhile, until September, 2016, 10 bi-monthly alumni newsletters have been published in order to provide various communication platforms. Lastly, SEA alumni have been encouraged to register as experts in the EC’s Community Research and Development Information Service (CORDIS).

Young researchers fellowships: AMR Surveillance Masterclass

Young researchers are the life blood of the scientific community. Developing up and coming scientific talent and instil the propensity for international cooperation among them were the main concerns of the project. One of the key activities to support this is the creation of thematic mobility fellowships for young researchers to establish collaborative links. As a result, an ASEAN-EU AMR Surveillance Masterclass was created to ensure that comprehensive network was constructed through this effort. 12 young researchers from across the globe

Fellow profile

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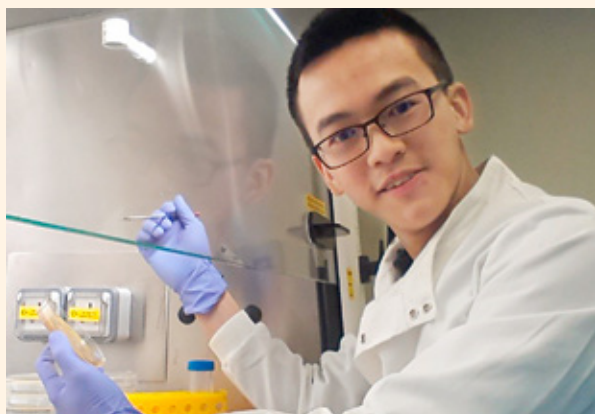
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Project/Interests: Collaborative Drug Discovery Programme focusing on drug discovery, drug repurposing and rationale of drug usage

Report

The training at Liverpool and Bangkok were very fruitful and productive to all delegates because the organiser had invited many eminent speakers to facilitate networking and discussion with regional stakeholders on current challenges and strategies related to antimicrobial resistance (AMR). Unlike other workshops or seminars, the organiser has only selected about 12 participants, which allows maximum interactions among the participants and facilitators. I am fairly new to One Health Initiative and certainly this workshop has connected me to the right people for collaboration as well as broadens my understanding to One-Health Initiative. It is inspiring to learn that developed countries have such systematic health system for their public. There are definitely much room for improvement in Malaysia's health system.

As a drug discovery pharmacist, I am biased to training related to the technical capacity for One Health. I am very glad the trainings covered the application of cutting edge surveillance technology and research activities by national and regional



laboratories. Prof Peter Silley (University of Bradford), one of the panel members in Clinical & Laboratory Standards Institute (CLSI) United States, shared about technical specification in laboratory setting for testing. We were also introduced to cutting edge technology by Prof Mark Fielder (University of Kingston) and Dr Alan Darby, Dr Mathew Ellington (Public Health England) and Dr Kate Baker (University of Liverpool). We also had the opportunity to visit the Next-Generation Sequencing (NGS) Laboratory in Institute of Integrative Biology, University of Liverpool. I always send my samples for NGS and yet this is my first time meeting the machine. Also, we visited the Animal Facilities in Chulalongkorn University and laboratories in Mahidol University.

Nonetheless, I am very grateful to the organiser, who has put in topics such as epidemiology, and qualitative analysis. Being a laboratory based scientist, it is always challenging to facilitate collaboration with epidemiologists and social scientists. I learn their perspective and their great works in AMR. With the expertise from the group members, we have designed proposals to tackle AMR. We proposed 2 potential projects, namely "Qualitative analysis of antimicrobial usage in crocodile farming" and "National AMR Surveillance of enterobacteriaceae Isolated from Humans in Hospitals: Pilot Study in a Southeast Asia Country". The proposal writing exercise was very productive and certainly an effective way to facilitate discussion.

Overall, it is my honour to participate in this great workshop. I have built new friendships and collaborators across the world. It is certainly only possible through such workshop. Our laboratory welcomes all collaborators who are interested to investigate any bioactive compound with potential medicinal properties as well as elucidating novel biomarkers for these diseases. Our team is having ongoing discussion with researchers from Liverpool Tropical Medicine (Liverpool University), University College Dublin and Chulalongkorn University on AMR related research collaborators.



were selected from various disciplines to train together on the topic of AMR Surveillance. They participated in a series of workshops conducted during Summer 2016 by senior experts in AMR from the University of Liverpool, Chulalongkorn University and Mahidol University.

In Liverpool, participants were exposed to the wider context of the topic, linking various disciplines, the policy interface, new technologies for better research outputs and potential funding sources. The talks were also structured to allow fellows to understand their current position in the wider context of the field, before going into discussion to allow them to flex and expand their thoughts into multidisciplinary research and multilateral collaboration. This was complemented by the sessions in Bangkok which provided a more practical view of the research through workshops and field trips. Areas that were covered included industry partnerships and how research could support better animal husbandry. Discussion sessions were more focused towards establishing potential research projects highlighted in this report, of which fellows could explore in future.

Due to the selection process, fellows came from a variety of backgrounds. The fellowship has been a platform for young researchers to understand the landscape of the topic and also a good time to network with their peers and discuss the complementarities of their respective expertise and research topics. The proposed projects highlighted in this report would serve as a catalyst for the fellows to engage and collaborate among themselves, and a range of other stakeholders they are not normally exposed to. Fellows may tap into this network of collaborators to create more comprehensive research projects, and bid for established and upcoming funding opportunities and programmes. It is the intent of the project that the linkages and networks established extend beyond the life of the project itself.

Association of Science Academies for ASEAN countries

On 29th November, 2011, a new initiative to form an Association of Science Academies for ASEAN countries was formulated during a meeting of the presidents of the Science Academies of ASEAN countries, IAC and EASAC, in Jakarta, initiated by Prof Sangkot Marzuki, president of the Indonesian Academy of Sciences, in close collaboration with the Royal Netherlands Academy of Arts and Sciences (KNAW).

The objective of the meeting was to see whether or not an intention to establish an association of Science Academies of ASEAN Countries would attract the commitment of major stakeholders and would thus prove to be a viable initiative. And if so, to take the very first steps in addressing issues as to what organisational shape, primary tasks, political embedding, formal endorsement, governmental support, etc. this network should endeavour to embrace.

The participants formulated the following conclusions:

- It was unanimously agreed to initiate an Association of ASEAN academies of sciences in the form of a unified association or network of science academies of ASEAN member states;
- The Association of ASEAN science academies of science is to be a platform to create focus and mass, in order to issue joint science advisory reports to national governments and ASEAN governing bodies on topics that are relevant for the ASEAN region as a whole;
- The Association of ASEAN science academies should also provide the opportunity to interrelate more efficiently with other international associations, like e.g. the European Union, in terms of providing joint science policy advisory reports;
- Founding an Association of ASEAN science academies as a subset of (south East) Asian science academies to form an association focussed on ASEAN, is justified by the existence of ASEAN as a regional political entity;
- An Association of ASEAN science academies should be open to all ASEAN member states. Member states not having a science academy can either be represented by its Ministry of Science, or be represented by a science academy of another ASEAN country;
- An Association of ASEAN science academies is to be considered as a regional network of ASEAN academies of sciences, linked to the political entity of ASEAN, but explicitly within the larger framework of ASIAN networks, including countries such as India, Korea, China, and Japan;
- An Association of ASEAN science academies should be endorsed by each member state National government, and by the ASEAN-COST committee;
- Building a track record in terms of publishing independent, relevant, timely, credible, legitimate and comprehensible Science Advisory Reports, is one of the earliest and main tasks of an Association of ASEAN science;
- Links to the European Union and the European Academies Science Advisory Council (EASAC) are to be pursued in view of their common goals and structure.

SEA-EU-NET partnership with EURAXESS ASEAN

Due to our focus on supporting research and innovation partnerships, SEA-EU-NET has naturally been partnering with the EURAXESS ASEAN team to bring funding opportunities and programmes to a wider audience. Among some of the key events, these partnered events are typically well-received among various stakeholder groups intending to further their collaboration with European partners.

“Advancing your Research Career in Europe: Funding and Fellowship Opportunities for Researchers in Southeast Asia”

11-13 May 2016
Hanoi / Bangkok

SEA-EU-NET partnered with EURAXESS ASEAN in the organisation of the two mobility events in Hanoi and Bangkok on 11 May and 13 May. The fantastic paved the way for enhanced researcher mobility and research collaboration between Europe and ASEAN. Over 300 researchers from more than 40 research institutions across ASEAN followed the invitation of EURAXESS ASEAN and SEA-EU-NET to engage with representatives of leading European research and funding agencies and to take the

ASEAN-based researchers. Not only did they share their research experience in Europe with the audience but they also passed on their valuable tips and advice.

As noted by Minister Counsellor Mr Alejandro Montalban of the Delegation of the European Union to Vietnam in his welcome address, increasingly, research and innovation are global activities that require co-operation between multiple partners in order to find more effective solutions with respect to global challenges such as lack of food and water, or energy security or climate change. His colleague Ana Maria Pena Segura, Attaché at the Delegation of the European Union to Thailand echoed his sentiments. The mobility of researchers, she explained, can play an important role in tackling global challenges as mobility enables both research institutions and their individual researchers to broaden their



Figure 3: “Advancing your Research Career in Europe: Funding and Fellowship Opportunities for Researchers in Southeast Asia”

first steps towards mutually beneficial research mobility experiences and collaborations.

The programme was packed with information on available funding opportunities as well as practical advice, for example on available partner finding tools, personal relocation assistance or application procedures. Additional one-on-one sessions gave plenty of opportunity for in-depth discussions with the European speakers. The undisputed highlight of the event were two roundtable sessions with a panel of highly accomplished

horizons, share experiences and knowledge and learn different approaches to carrying out research. It is a win-win process in which everyone involved benefits.

Many research institutions in ASEAN enjoy an excellent reputation worldwide and are renowned for their collaborative approach with international research partners. Both ASEAN and the EU will benefit enormously from increased participation of ASEAN-based researchers and institutions in European research programmes, exchanges and other forms of co-operation.

European Research Days 2016

17-25 November 2016
Malang / Jakarta / Kuala Lumpur / Bangkok

SEA-EU-NET and EURAXESS ASEAN hosted close to 500 researchers as part of the European Research Day which covered a total of five cities in four countries. Full-day workshops took place in Indonesia (Malang, Jakarta), Singapore, Malaysia (Kuala Lumpur) and Thailand (Bangkok). Each training session covered the application modalities and strategies for successful application to both, the Horizon 2020 MSCA-IF and MSCA-RISE calls 2017.

The workshops were attended by highly qualified expatriate European and international researchers, of which a third either had plans to apply to the pro-

sessions by delivering testimonials of their own Marie Curie experiences.

Close collaboration with local partners—Agency for Science, Technology and Research (A*STAR, Singapore), R&D Committee of the European Chambers of Industry and Trade (Malaysia), LIPI (Indonesia), NSTDA (Thailand)—and coordination with the EU Delegations in the four locations allowed for high visibility. Feedback collected from the participants reveals very high levels of satisfaction with up to 100 % of participants agreeing that the workshop met their expectations (lowest score



Figure 4: European Research Days 2016

gramme in the foreseeable future; had previously applied to or participated in an MSCA call; or were currently in the process of preparing an application for an MSCA 2017 call. The close collaboration with the regional network of Marie Curie Fellows has been particularly instrumental to the success of this event. Members of the network assisted in the logistical planning (notably Malang), identified prospective applicants to the MSCA IF and MSCA RISE calls within their professional networks, and actively participated in the workshop

89 %), up to 97 % agreeing that the content was useful (lowest score 89 %), and up to 100 % agreeing that they would recommend the workshop to their colleagues (lowest score 85 %).



Figures 5 and 6: European Research Days 2016

Projects

A fundamental objective of the SEA-EU-NET project has been to increase the participation of ASEAN partners in FP7 and Horizon 2020 projects. This requires a lot of effort to ensure that the necessary groundwork is in place for the collaboration to happen, as evidenced in the following case studies.

Case study of successful projects: LED Project

Step by Step Guide to Incorporating a Specific International Cooperation Action (SICA) Topic into a FP7 Work Programme

All INCO-NETs pursue—more or less intensively—the aim to incorporate the “SICA Calls” which have been aligned for their region into the thematic work programmes of the FP7. This process is usually complex and lengthy and very often not successful (at least we experienced this in the SEA-EU-NET). As an example of successful process, we herewith describe, how we have achieved with measures in the SEA-EU-NET, a SICA Call in the 2012 Work Programme “Industrial Technologies” targeted to the ASEAN countries.

1st Step: High-level S&T Experts from Southeast Asia Meet with European Commission

On 6-7 April 2010, SEA-EU-NET organised a meeting between high-ranking science representatives of the ASEAN countries and representatives from the thematic fields of the EU-Commission/DG Research. At this occasion the Directorate “Industrial Technologies” (see picture) expressed their interest in cooperation with the ASEAN and proposed a workshop to defining topics.



2nd Step: Political Meeting between the European Commission and the ASEAN Committee on Science and Technology

Representatives of DG Research from the European-Commission participated in the 29th ASEAN COST Meeting in Laos on 16-17 May 2010. In the technical working group of the ASEAN COST on “Industrial Technologies” they discussed their interest in a joint activity and the subject areas “Biowaste” and “Photocatalysis” were found to be promising. The chairman of the technical working group, Dr Oh from Singapore supported the proposal of a joint workshop.

3rd Step: Workshop on Choosing Topics: EU-South East Asia Workshop on Materials Research for Environmental and Health Applications

On 10-11 November 2010, SEA-EU-NET, the European Commission and ASEAN COST organised a workshop to define topics. 18 scientists from the EU and the ASEAN participated in a “EU-South East Asia Workshop on Materials Research for Environmental and Health Applications”. “Photocatalytic materials for depollution” has been identified as the most promising topic for research cooperation.

The workshop report was presented at the European Commission on 13 January 2011. At this occasion a possible call for proposals based on the results was discussed as well as the possibility of a related “Brokerage event”.



4th Step: Call NMP.2012.2.2-6 Photocatalytic Materials for Depollution

The SICA Call with ASEAN as target region was published on 20 July 2011. The content of the Call can be deduced in large parts from the workshop report on choosing topics. The Call has a total budget of €14m, enabling the funding of a number of projects.

5th Step: Brokerage Event: EU-South East Asia Symposium on Photocatalysis for Depollution Technologies

SEA-EU-NET organised (immediately prior to the publication of the call) a brokerage event in Tam Dao, Vietnam on 13–14 July 2011. A total of 38 participants from the EU and the ASEAN took part. As a result, 4 consortia were set up to address the call.

Lessons learnt:

- The whole process is lengthy and complex
- An initial interest of the thematic directorate in cooperation with the respective partner region is a basic requirement
- There is a parallel top-down/bottom-up process between “politics” and science (on identifying topics)
- Cooperation with the respective NCP system is very important

Chikungunya

The tropical island of Langkawi was an incongruously idyllic setting for a conference dedicated to the debilitating infectious disease Chikungunya. The conference was organized by the European project ICRES, and supported by our own SEA-EU-NET project, which seeks to expand and deepen research collaboration between Europe and Southeast Asia.

Meaning ‘that which bends up’ in the Makonde language, Chikungunya’s name is derived from the crippling joint pain which is one of its most severe symptoms. The disease is transmitted from person to person by mosquito, and presents like a particularly severe flu, with victims also suffering headaches and skin rashes. Whilst rarely fatal, the symptoms of Chikungunya can persist for many months, and no specific treatment or vaccine for the condition exists.

Chikungunya is a clear example of a re-emergent infectious disease. After an interlude of several decades in which few cases were reported, Chikungunya broke out in 2004 in coastal communities in East Africa. The disease spread to the French overseas department of La Reunion and infected over 270,000 people. At its peak in early 2006, 45,000 cases of Chikungunya were diagnosed in a single week, placing great strain on a health-care system in which a quarter of doctors and nurses were also suffering from the condition. The disease has since spread to India, Asia, and even outside the tropics, to Italy and France. Italy reported endemic transmission of Chikungunya, with an outbreak triggered by someone who had contracted the disease in India but spread to others locally by mosquitoes. One of the main areas of concern around Chikungunya is that a warming climate is causing mosquitoes to be found at more northerly latitudes, increased the risk of introducing mosquito-borne diseases to populations with no native immunity.

The ICRES consortium is led by the UK’s Pirbright Institute, and together with collaborators in Europe and Southeast Asia, the project has generated an improved understanding of the disease. This has improving screening and should eventually enable the development of antivirals and vaccines (with an experimental vaccine candidate reported by a separate group at Wageningen in the Netherlands earlier this year).

We have been involved in the project since inception. Predecessors in the Southeast Asia Science and Innovation team convened a matchmaking workshop in Singapore to develop consortia for European research funding, which resulted in the formation of ICRES. We regard this as one of the best examples of Europe-Southeast Asia collaboration enabled by the SEA-EU-NET project, addressing a shared societal challenge, and leveraging the complementary capabilities of European, Malaysian and Singaporean partners.

<http://blogs.fco.gov.uk/tomcrawley/2013/10/30/combating-re-emergent-infectious-diseases/>

Policy

SEA-EU-NET has also been actively supporting regional S&T policy and relevant consultations to support evidence based policy making. Among the key channels of dissemination, are directly with ASEAN COST and regional policy platforms. The project has been moderately successful in engaging with partners, and has been actively producing consultative reports in areas of regional importance such as Biosecurity, AMR and One Health.

The ASEAN-EU dialogue on S&T cooperation

On 24 August SEA-EU-NET took part in the ASEAN COST-EU dialogue meeting during the 9th ASEAN Science and Technology Week (ASTW) held in Bogor, Indonesia. Partners of SEA-EU-NET joined the EU delegation to introduce cooperation activities between ASEAN, EU and their member states. Representatives of Euraxess were also present.

ASEAN COST and the EU delegation stressed the importance of internationalization to address the STI challenges today and discussed framework conditions for cooperation, in particular IPR issues (open access) and mobility (fellowship funding). These questions could be addressed in link with APASTI (ASEAN plan of action for Science, Technology and Innovation) and be the object of one or several sessions during the ASEAN-EU STI Days.

SEA-EU-NET, CONNECT2SEA, SUSTAIN EU-ASEAN and Euraxess were then invited to present several of their concrete actions for cooperation support. In the case of SEA-EU-NET, the STI Days, funding scheme and innovation report (among others) were presented and well received.

During the 9th ASTW, SEA-EU-NET also held a booth providing to the event’s participants information on the project’s activities and Horizon 2020.

R&I policy consultation

Through the SEA-EU-NET 2 task of Ensuring Policy Coherence (Synergies with Development and Innovation

actors), the project intended to enhance science and technology (S&T) and development collaboration between the EU and Southeast Asia related to Health, Food security and safety and Water management. The task of Ensuring Policy Coherence attempted to bridge the gap between science and international development by involving innovation actors to ensure the implementation of research results. The specific aims of the task were:

- To establish synergies between and with regional S&T and development initiatives from the EU and ASEAN;
- To promote a structured information exchange on innovation policies and activities between the EU and ASEAN;
- To stimulate networking between and with innovation actors from the EU and ASEAN;
- To identify best practices on activities, projects and initiatives which specifically target policy coherence.

Aiming to achieve the aforementioned goals, bi-regional consultation events – targeted especially at policy-makers, other high level officials, representatives of S&T and development programmes, as well as innovation agencies and other relevant S&T and innovation actors from ASEAN and Europe – were planned. One of these bi-regional consultation events, the ASEAN-EU Research and Innovation Policy Consultation was held during the ASEAN-EU STI Days, in Paris (17–19 March 2015). This policy consultation was held with the objectives of presenting survey/interview key results and recommendations, engaging experts and targeted audiences in discussions on how to move forward towards a better/more efficient and productive co-operation in the three thematic areas, as well as facilitating an ASEAN-EU policy dialogue in the areas of agri-food, water, and health. Figure 7 explains the sequential steps of the consultation, leading up to and including the event.

With a view to develop a thorough understanding of the three thematic areas of Health, Food security and safety and Water management in SEA and EU countries, a wide range of experts were contacted. To address all the topics crucial for STI cooperation between these two regions, a detailed template with questions

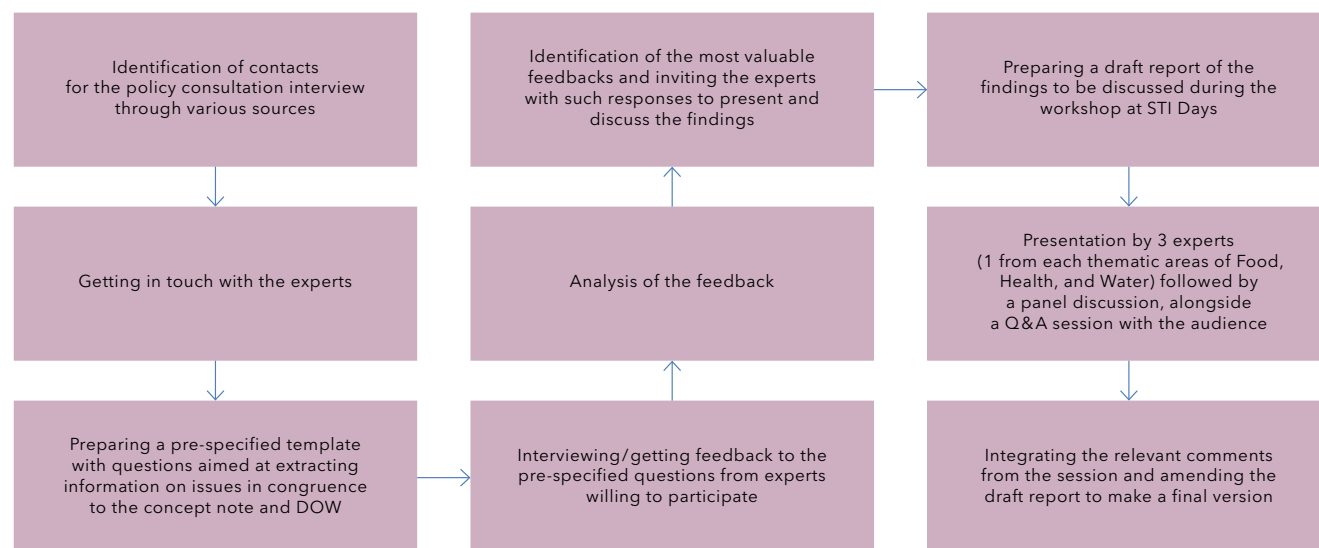


Figure 7: Process of consultation

on issues in relating to the concept note and Description of Work (DOW) for the SEA-EU-NET 2 was prepared and provided to a series of experts before the event. Virtual interviews with 15 selected experts were also provided. The comments and feedback were analysed and selected experts invited to present and discuss their comments during the ASEAN-EU Research and Innovation Policy Consultation Session on 19 March 2015. A report titled “EU and ASEAN: Food, Health and Water Practice” came out as a result of this consultation and includes insights from the experts and also comments and feedback from other participants of the ASEAN-EU Research and Innovation Policy Consultation Session, as well as further research on relevant topics identified during the various interactions in addition to insight by the SPI Team (Sara Medina, Nishant Shandilya and Martha Octavia).

The report discusses recent innovation measures, established support structures, exchange of best practices in this respect, discussion of how innovation can be fostered in the thematic areas, etc. It also presents major priorities in the thematic areas both from STI and development perspectives with the aim to set up common research and innovation agendas in the thematic areas.

Several events have been done in order to get feedback for this consultation as well as to disseminate the finding of the consultation. The first workshop was held on 16 April 2015. A second event, a public lecture, was carried out in September 29, 2015, which was co-organized by EU Centre in Singapore & SPI and hosted by S. Rajaratnam School of International Studies, Nanyang Technology University. The most recent session was the result dissemination of the policy consultation held in May 12, 2016 during the ASEAN-EU STI Days Hanoi 2016.

To download the report please refer to the link:
<https://sea-eu.net/object/document/271>

AMR

ASEAN is home to about 625 million people – 8.8 % of the world’s population. It is the regional intergovernmental platform in which the 10 countries of Southeast Asia have agreed to foster regional cooperation and facilitate economic integration. The organisation has highlighted “Combating AMR” in their Post-2015 Health Development Agenda, to underline the importance this issue is to the group of nations. However, due to differing levels of development and collaboration among the member states, there is limited coordination and great variation between countries in this region in their approaches to address AMR.

With attention on AMR slowly increasing, there has been a greater focus on the two cornerstones of managing this important issue, research and surveillance. However, these components have been until recently often been ignored or under-resourced as other more urgent issues, such as pandemics and disaster relief, took centre stage. Learning from this, governments have begun to increase funding in this area, including the US Government through the Global Health Security Agenda, the UK through the US\$ 375 million Fleming Fund, and the WHO’s development of the Global AMR Surveillance System (GLASS). In Southeast Asia, each country is at very different stages of development in strengthening their AMR surveillance systems. However, the data that has been collected demonstrates that AMR is a major problem. Tackling AMR requires that countries adopt more effective tools and practices.

An AMR Research and Surveillance Roundtable was convened in conjunction with the ASEAN-EU STI Days 2016 in Hanoi, Vietnam. A state of play report was circulated before the event as a non-paper to facilitate discussion and verification from representatives from each country. The roundtable gave potential partners an overview of activities going on in all the countries

represented. The roundtable came up with a set of recommendations and key strategic areas for collaboration between ASEAN and EU on AMR.

In concluding the discussion, all country representatives around the table agreed to suggest to ASEAN that a network on AMR research & surveillance should be formed. This action should be brought forward by the members around the table to the relevant organisations.

Another important issue is that the concept of One Health should be instilled throughout all programmes that are addressing AMR. Livestock and agriculture should be considered in surveillance programmes, and thought should be given as to how best to connect with ministries on the issue of food safety and animal health. These questions align with how the groups can collaborate with international programmes to promote a wider understanding of the challenge of AMR.

The roundtable recognised the importance of common standards for laboratories and clinical microbiology, as confidence in the data created is crucial to its use. Given the amount of surveillance data being collected through the various local and national programmes, it will be crucial to use this to its fullest potential.

For more information, please refer to the link:
https://sea-eu.net/object/document/274/attach/20161201_AMR_Roundtable_Policy_Note.pdf

One Health

Pandemics, food security and newly emerging diseases often dominate the international media headlines, highlighting the the systemic interconnections between human, animal and environmental health. One Health is a multidisciplinary approach to achieve optimal health for people, animals and the environment through local, regional and global research collaboration.

One Health has gained much more attention due to the rise of zoonotic disease epidemics crossing from animals to humans such as SARS, avian influenza, and Nipah virus. With 70 % of emerging diseases being of animal origin, this has become a crucial issue, especially for Southeast Asia due to the increasingly high urbanization rate and dramatic expansion of intensified livestock production.

To identify practical challenges linked to implementation of the One Health concept and identify gaps and needs for One Health research, an expert workshop “From One Health Theory to Reality: Practical challenges, impact of OH initiatives and gaps in research” was held in Vietnam. The workshop was held from 13 to 15 October 2015 in Hanoi, Vietnam and brought together more than 100 professionals in human, animal and environmental health from 17 countries (71 experts from SEA, and 29 experts from EU/International). 41 experts were from the animal health sector, 49 from the public health sector, and 7 from the environment/wildlife sector.

The workshop provided information on the proof of concept, the impact/added value of One Health implementation in the field, with over 20 scientific presentations, shared experiences, interventions and solutions to cover three areas i) One Health surveillance; ii) One Health and EcoHealth research at the interface between wildlife, domestic animals and people; and iii) implementation of a One Health approach to address challenges in antimicrobial resistance.

Main challenges identified and research priorities:

- Communication, collaboration and coordination challenges: How to improve collaboration of all sectors at all levels?
- Methodological challenges, including bottom up approaches and engagement of communities
- Institutional/policy challenges, including involvement of the private sector

Two topics came out as conclusions of this workshop, and are addressed to funding agencies, especially to upcoming HORIZON 2020 work programmes and call for proposals.

<https://sea-eu.net/object/document/217>

Water Related Disease

Population within SEA is growing at an exponential rate, with rapid urbanization and rapidly degrading key ecosystems with huge impact on the most vulnerable populations. Clean fresh-water is essential to maintain the production of adequate food supply for the human and animal population. Climate change, environmental disturbances – e.g. dam building, irrigation, wetland modification – globalisation of trade, loss of biodiversity are important drivers of infectious and parasitic diseases including water-related diseases in SEA and could have a negative impact on the health systems. Water pollution can severely reduce biodiversity in aquatic and terrestrial ecosystems, and facilitate the spread of serious human and zoonotic diseases. Water management and the risks and benefits to human health are complex environmental health challenges, and should be tackled through fully interdisciplinary research in order to promote a systems model approach.

CIRAD (the French Agricultural Research Center for International Development), in collaboration with the Centre Merieux of Laos, National Institute of Health Laos and Pasteur Institute of Laos, have organized a “**Water-related diseases workshop**”, which was held from **15th to 16th of February 2016 in Vientiane, Lao PDR**. This workshop merged 3 topics: **Health, Water-Management and Food Security**.

This expert workshop gathered 25 participants and managed to obtain the following objectives:

- i) To share information (programs and projects) and scientific knowledge on water-related diseases;
- ii) To stimulate EU-SEA cooperation by promoting exchanges between EU and ASEAN experts, and build up coordinated international projects;
- iii) To develop networking on water related diseases;

This workshop has highlighted key research challenges:

AMR

The expert group noted that a lot of researchers in SEA are already working on the molecular and ecological mechanisms of AMR emergence through descriptive study. There is a need to develop more analytical studies in order to understand the mechanisms of resistance transmission between different compartment (animals, human and environment), the role of water and waste (farm or hospital) as a vector of transmission and to propose more practical recommendations for antimicrobial management at farms and hospitals. The group proposed to investigate key risk factors of AMR emergence and their spread in the varied farming systems in SEA, characterising these systems in relation to practices—crucially including usage antimicrobials—and their contribution to AMR and the risk of human infection. The idea will be to focus on key indicator bacteria; modelling and epidemiological tools, such as contact networks; risk estimation and case-control studies, to assess the risk of AMR transmission between compartments. The impact of changes in farming practices at farm level could be assessed and a One Health surveillance system could be tested. The results of these intervention studies could then help in the design of efficient and adapted policies and recommendations for AMR control/surveillance.

Water

From the different presentations given during the meeting, the need to assess the health consequences of water modification in the great Mekong Basin received the full attention of the researchers and experts. They proposed first to characterize the waterscape modifications. This could include the assessment of landscape connectivity/fragmentation, the water movement including flooding regimes, water quality (i.e. safety ; agrochemicals), the freshwater communities structure and function (emphasis on snails and parasite transmission dynamics), the irrigation practices (local level) and the dam impacts (at regional level). Then the most important diseases link with waterscape modification, in term of health impact, economics importance, livelihood, side effects should be identified and prioritized. The objectives will be to develop statistical or mathematical models to test changing scenario and then assess the impact of the changes on the system before setting up interventions.

Biosecurity implementation in action: ASEAN life scientists at the Biological Weapons Convention in Geneva

The ASEAN Academies of Science together with the U.S. National Academy of Sciences (US-NAS) and the Royal Netherlands Academy of Arts and Sciences (KNAW) have been involved in a number of important meetings on biosecurity in the ASEAN region during the past years. A successful Biosecurity workshop has been organised by the Indonesian Academy of Science (AIPI) during the 9th ASEAN Science and technology Week in Bogor (August 2014). And in May 2015 a biosecurity meeting was linked to the celebration of the 25th anniversary of AIPI in Jakarta. Later that year the biosecurity issue was one of the central elements in workshops on responsible science in Yogyakarta and in Kuala Lumpur.

The Meeting of States Parties (MSP) of the Biological Weapons Convention (BTWC) on 14-18 December 2015 was seen as an important opportunity for Academies of Science to identify and highlight relevant issues in the fields of science and technology that should be dealt with during the 8th Review Conference that will take place in 2016. That is why US-NAS and KNAW have organized two activities on December 13 and 14 to showcase the biosecurity-related developments of the ASEAN.

The first activity was a one day-long pre-conference workshop on Sunday, December 13, with the following aims: 1) to present biosecurity-related activities organised by ASEAN scientific organizations in the region; 2) to give scientists and Academies’ officials from ASEAN countries the opportunity to become acquainted with the BTWC; 3) to explore how life scientists and Academies, particularly from the ASEAN region, can contribute to the preparation of the 8th Review Conference of the BTWC. Scientific experts from five ASEAN states (Malaysia, Indonesia, Philippine, Thailand and Vietnam) attended the conference. They gave presentations about the way their governments and scientific communities deal with biosecurity issues and identified possible contributions to the process in the BTWC.

The second activity was a side event during the MSP conference on December 14. The main aim of this side event was to provide participants in the MSP (diplomats, government experts) with the opportunity to interact with life scientists from the ASEAN region. The results of the preconference held on 13 December about biosecurity activities in the ASEAN region were presented by participating ASEAN scientists. They gave examples of how (ASEAN) scientists and Academies of Science can support the goals of the BWC and how they can contribute to the preparation of the 8th Review Conference of the BTWC.

Publications

One key goal of the project is to communicate our discoveries and provide information to support ASEAN-EU STI collaboration to a vast range of stakeholders and audiences. Partners in the project have been actively communicating and publishing on a variety of platforms through different forms of media.

“Co-publication analysis among ASEAN countries and their collaboration with the EU and Associate Countries”

Over two years from 2014 to 2016, the SEA-EU-NET analysis team carried out analyses of research output in ASEAN Member States, combining Web of Science and Scopus statistics. Some of the key results:

In the examined time span of 2004 to 2014, the **overall ASEAN scientific output in terms of scholarly publications amounted to ca. 550,000**. The growth of annual output has been striking in this decade: In 2004, around 23,000 publications with ASEAN-based authors were indexed in the citation databases. In 2014, it was 80,000. **Output thus more than tripled** (to a certain extent this also has to do with improved database coverage of local journals).

Out of all ASEAN countries, **Singapore (SG) has the highest number of publications** (Singapore-based authors are involved in 34 % of all ASEAN output). On the other hand, **Malaysia (MY) is growing fastest in terms of its publication output since 2004 and now has the highest annual publication output in the region**. Differences in annual output of the ASEAN Member States have increased 2004-2014, which reflects different levels in R&D investment.

International collaboration plays a major role in the publication output of the ASEAN region. Overall, around 39 % of the publications in ASEAN are international co-publications. In the most recent years, the share has

been slightly above 40 %. Globally, **the EU is the strongest partner in co-publication collaboration. 32 % of all international co-publications** (and 13 % of all publications) in ASEAN feature at least one EU-based co-author. Other important co-publication partners are the USA, China, Japan, Australia, and India.

International collaboration shares vary considerably among the ASEAN Member States. 66 % of publications with Vietnam-based authors involve at least one international co-author. In the Philippines, it’s 55 % of the publications, in Thailand only 38 %.

As regards the research areas in Southeast Asian publication output, strongest in terms of number of national publications as well as international co-publications are **Clinical Medicine, Information & Communication Technologies (ICTs), and Engineering**. These thematic output patterns are fairly consistent with global patterns with the exception of a **greater relevance of ICTs in Southeast Asian output** compared to global output.

The analysis of thematic patterns in output becomes more fruitful when combined with the analysis of geographic patterns. In the case of Clinical Medicine, the strongest intra-ASEAN ties are Malaysia-Singapore, Thailand-Singapore, and Malaysia-Thailand. The strongest international co-publications in this field were recorded for Thailand-USA, Thailand-EU, and Singapore-Australia. Clinical Medicine is almost always at the top of each country’s co-publication ties; exceptions are Biology and Earth and Environmental Sciences in case of Indonesia-Germany, Physics and Astronomy in case of Vietnam-Germany, and Biology as well as Chemistry in case of Myanmar-Germany. Another noteworthy exception on the intra-ASEAN level is Malaysia-Indonesia, where Clinical medicine is considerably weaker than in other country ties. In case of both Engineering and Information & Communication Technologies, the strongest intra-ASEAN ties are attributed to Indonesia-Malaysia and Malaysia-Singapore (other country ties are far behind their output level), the strongest international ties to Singapore-China, Singapore-USA, and Singapore-EU.

Patent analyses

As part of our quantitative analyses of research cooperation between Southeast Asia and Europe, the SEA-EU-NET team also studied patenting activity in Southeast Asia. We analysed patent application activity at major patent authorities in Southeast Asia in order to get a feeling for the intellectual property market and portfolio in the region. We also analysed patterns in national and international patent applications involving ASEAN-based inventors. Finally, we analysed patent activities by ASEAN-based applicants.

The analysis of patenting activity at major patent authorities shows two things: First, we see that the region is an important market for intellectual property. Patent filing activity has increased in all major patent offices. Second, there are major geographical imbalances in output. The majority of patent applications between 2003 and 2013 is filed either in Singapore or Malaysia. Although at a lower level, the number of filings still increases in all other patent offices in the region. Not only is patent filing in Southeast Asia increasing, but also patenting output involving ASEAN-based inventors.

From 2003 to 2013, the annual output of international patent applications with ASEAN-based inventors tripled. National patent application output grew by around 30 %. These numbers reflect an increase in innovation activity, but also a considerable policy push towards patenting, especially when it comes to international patents.

Technology-wise, the region’s knowledge production is highly specialised in national patent applications, while international patent applications do not show such a clear focus. Most national applications represent technologies needed for the production of semiconductors, computer technology, audio-visual technology, electoral machinery, apparatus, energy, measurement, and telecommunications. International applications most often are technologies for computer technology, audio-visual technology, semiconductors, medical technology and biotechnology.

Co-inventions, here understood as applications with inventors from more than one country, represent knowledge flows between different people, companies and regions. During the years 2003–2013, ASEAN-based inventors collaboratively developed 3,500 national and international patent applications respectively. When the result of a collaborative research process is a nationally filed patent application, partners are most frequently based in the United States. If the invention is getting filed as an international patent application, the most important partners are based in the United States and Europe. Technology-wise, partners from the US are most important in the development of semiconductors, pharmaceuticals and computer technology. European partners are most often involved in the development of technology in the fields of basic materials chemistry, organic fine chemistry and macromolecular chemistry and polymers.

The analysis of ASEAN-based applicants allows us to draw some other interesting conclusions. IP ownership in ASEAN is concentrated: The top 100 applicants own 81 % of national and 65 % of international applications involving ASEAN-based applicants. Two thirds of national patent applications and almost 90 % of international PCT applications involving ASEAN-based applicants also involve ASEAN-based inventors. This means that the knowledge imports to the region by ASEAN-based IP owners are limited. Conversely, foreign ownership, i.e. knowledge outflows, are slightly more frequent

Cooperation patterns: https://sea-eu.net/facts/cooperation_patterns/spotlight_sea-eu

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