



**Australian Government**

---

**Department of Innovation  
Industry, Science and Research**

**SUPPLEMENTARY SUBMISSION TO THE  
JOINT STANDING COMMITTEE ON FOREIGN AFFAIRS,  
DEFENCE AND TRADE**

**INQUIRY INTO AUSTRALIA'S RELATIONSHIP WITH THE ASSOCIATION OF  
SOUTH EAST ASEAN NATIONS (ASEAN)**

# TABLE OF CONTENTS

---

<b>TERMS OF REFERENCE</b>	<b>3</b>
---------------------------	----------

---

<b>AUSTRALIAN SCIENCE ENGAGEMENT WITH ASEAN</b>	<b>4</b>
---	----------

---

<b>TABLE 1: KEY INDICATORS: ASEAN, AUSTRALIA AND MARKER COUNTRIES</b>	<b>4</b>
---	----------

<b>TABLE 2: RESULTS OF STAKEHOLDER SURVEY</b>	<b>5</b>
---	----------

<b>BRUNEI DARUSSALAM</b>	<b>5</b>
--------------------------	----------

<b>CAMBODIA</b>	<b>5</b>
-----------------	----------

<b>INDONESIA</b>	<b>6</b>
------------------	----------

<b>LAOS (LAO PEOPLE'S DEMOCRATIC REPUBLIC)</b>	<b>6</b>
--	----------

<b>MALAYSIA</b>	<b>6</b>
-----------------	----------

<b>MYANMAR</b>	<b>6</b>
----------------	----------

<b>PHILIPPINES</b>	<b>6</b>
--------------------	----------

<b>SINGAPORE</b>	<b>7</b>
------------------	----------

<b>THAILAND</b>	<b>7</b>
-----------------	----------

<b>VIETNAM</b>	<b>7</b>
----------------	----------

<b>MULTILATERAL</b>	<b>7</b>
---------------------	----------

## **TERMS OF REFERENCE**

---

The Joint Standing Committee on Foreign Affairs, Defence and Trade shall examine and report on opportunities for expanding Australia's relationship with the countries of ASEAN, with particular attention to:

- opportunities to improve Australia's involvement in ASEAN;
- opportunities to enhance regional security through Australian involvement;
- free trade agreements with individual ASEAN countries;
- opportunities to enhance the regional economy;
- opportunities to improve cultural links; and
- the impact of global warming on the region.

The purpose of this submission is to provide factual material to the Committee in relation to the Terms of Reference.

The Department of Innovation, Industry, Science and Research made a submission to the Joint Standing Committee and attended the public hearing on 22 September 2008. The Chair of the Standing Committee requested "a supplementary submission that outlined where we have research and scientific cooperation between Australian institutes, whether they are educational ones or CSIRO, and different countries in ASEAN so we can see ourselves where we are at the moment".

The requested information is supplied in the following pages.

## AUSTRALIAN SCIENCE ENGAGEMENT WITH ASEAN

DIISR conducted a survey of available statistics and a stakeholder survey. A total of 27 Australian research organisations responded to the survey, including:

- 3 Publicly Funded Research Organisations (PFROs): CSIRO, ANSTO, AIMS
- 13 universities, and
- 11 medical research institutes, including Not-For-Profit (NFP) institutions.

These surveys have provided the following information on Australian science and research engagement with ASEAN:

- Table 1 presents key indicators for each country's science system, and data on joint publications with Australia, including recent growth in collaboration. Some key marker countries (USA, China and Japan) are included to provide perspective.
- Table 2 presents the results of the stakeholder survey.
- A summary is also provided for each country.

An extensive ANSTO submission is appended, and ANSTO will be appearing before the Joint Standing Committee on 6 November.

**Table 1: Key indicators: ASEAN, Australia and marker countries**

Country	Research Intensity	% of GERD funded by business	Researchers per million population	Joint papers in 2007	Growth in joint papers
Brunei	0.02% (2003)	N/A	274 (2003)	4	0%
Cambodia	0.05% (2002)	N/A	17 (2002)	15	275%
Indonesia	0.05% (2001)	15% (2001)	199 (2001)	108	64%
Laos	N/A	N/A	N/A	4	300%
Malaysia	0.60% (2004)	71% (2004)	503 (2004)	87	149%
Myanmar	0.16% (2002)	N/A	18 (2002)	5	0%
Philippines	0.14% (2003)	68% (2003)	N/A	57	148%
Singapore	2.24% (2004)	55% (2004)	4,997 (2004)	368	137%
Thailand	0.26% (2004)	36% (2004)	292 (2003)	204	229%
Vietnam	0.19% (2002)	18% (2002)	115 (2002)	46	119%
<b>Australia</b>	<b>1.78% (2004)</b>	<b>53% (2004)</b>	<b>4,053 (2004)</b>		
China	1.23% (2004)	66% (2004)	710 (2004)	1,534	193%
Japan	3.17% (2004)	75% (2004)	5,299 (2004)	833	39%
USA	2.58% (2004)	64% (2004)	4,770 (2004)	4,836	47%

Notes to Table 1:

- Expenditure and Researchers data is from the UNESCO *Global Science and Technology Statistics June 2008*. The most recent data for Australia available in this source is for 2004, so the data from the closest year available is used for all other countries and the year is indicated in brackets.
- Japan, China and Singapore have all significantly increased research intensity, and China and Singapore have increased the number of researchers per million population, since 2004.
- GERD stands for Gross Expenditure on Research & Development.
- Research Intensity is defined as GERD as a percentage of GDP.
- Researchers per million population is calculated on a Full-Time Equivalent basis

- The data on Joint Papers is from Thompson ISI *Web of Science*. The growth in joint papers is mostly calculated since 2001.
- For Cambodia, growth is calculated since 2003, as there were no joint publications in 2001 or 2002.
- For Laos, growth is calculated since 2002, as there were no joint publications in 2001.

**Table 2: Results of stakeholder survey**

Country	Significant interaction	Significant research collaboration	Moderate interaction	Minimal or no interaction	Formal agreements	Private / Industry Partner
Brunei	0	0	3	24	1	0
Cambodia	0	0	2	25	1	1
Indonesia	8	7	7	12	15	9
Laos	1	1	2	24	1	2
Malaysia	4	3	11	12	14	4
Myanmar	1	0	0	26	2	0
Philippines	1	1	7	19	7	1
Singapore	8	7	5	14	10	8
Thailand	6	6	6	15	10	3
Vietnam	7	6	9	11	13	4
Multilateral	1	0	7	19	3	1

Notes to Table 2:

- Table 2 reports the number of respondent organisations indicating a particular level of interaction with ASEAN members and multilateral organisations, the number indicating that they have an MOU or other formal agreement with an ASEAN member or multilateral organisation, and the number that indicated engagement with partners from the private sector.
- Most organisations that have significant engagement with ASEAN overall engage in significant collaborative research in addition to possible educational relationships.
- Almost all organisations reporting any level of engagement in a country indicated public (PFRO and/or university) partners, so these figures are not reported.
- The survey form, including definitions of terms, is attached for reference.

### **Brunei Darussalam**

Brunei's science and research system is small and Australian engagement with Brunei is extremely limited. CSIRO reported moderate collaboration in soil science research with Brunei. Some Australian universities indicated limited research collaborations, in niche topics such as fisheries, with a range of PFROs and universities in Brunei. However, Brunei was not a major ASEAN partner for any respondent.

### **Cambodia**

Cambodia's science and research system is also small and a limited partner for Australian researchers. In addition to aid and educational programs, some Australian universities engage in niche research collaboration with Cambodian PFROs and universities in areas such as political science, law and environmental science. Medical research institutes collaborate in research in particular diseases with a wide range of Cambodian partners, often in addition to aid-based projects.

## **Indonesia**

While small with respect to major partners such as China and the USA, Australia's science and research relationship with Indonesia is one of the more significant with an ASEAN member. Although Indonesia's science investment and workforce is low relative to the size of its economy and population, Australian researchers have a clear appetite for collaboration with Indonesian colleagues in a broad spectrum of organisation types. Similarly, Australian collaboration with Indonesia occurs in research areas right across the physical sciences, mathematical and information sciences, life sciences, business and economics and the humanities. Respondents of all types reported significant engagement with Indonesia in collaborative research, as well as extensive educational links and some aid-based programs. More respondents indicated collaboration with private or industry partners in Indonesia than for any other ASEAN member.

## **Laos (Lao People's Democratic Republic)**

Laos has a limited science sector, and almost no collaboration occurs with Australia. The most significant engagement reported by respondents was all educational or aid-based, with the exception of one medical research institute which has an office in Laos and conducts extensive joint research in infectious diseases with Lao PFROs, private research organisations and NFP organisations. Other smaller research collaborations were reported in health and environmental science.

## **Malaysia**

Although Malaysia has a relatively high level of investment in science, compared to the rest of ASEAN (with the exception of Singapore), Australia's collaboration with Malaysia is less than with Indonesia or Thailand. In addition to many significant educational engagements, both universities and medical research institutes reported research collaboration in areas such as health, pest prevention and the humanities with a wide range of partner institutions. CSIRO reports a significant research relationship with Malaysia in energy, marine, forestry and health sciences. Malaysia is second on the list of reported MOUs and other formal agreements with Australian institutions.

## **Myanmar**

Myanmar produces little science and most institutions reported no engagement. The exception was one medical research institute with an office in Myanmar, which conducts educational and aid-based projects in infectious disease research with government and NFP partners.

## **Philippines**

The Philippines has a modest science sector and, compared to other ASEAN members, a medium-low number of joint papers with Australia. In addition to a few aid-based programs, moderate research collaborations were reported by one medical research institute and several universities in areas including health, agriculture, chemistry, geosciences, computer science, business and management and the humanities. CSIRO conducts significant agricultural research collaboration with a range of PFRO, university and NFP partners.

## **Singapore**

Singapore is the clear leader in science and research in ASEAN, and spends a higher proportion of its GDP on research and development than Australia does. In fact, in 2004 Singapore's research intensity was very close to the OECD average of 2.21%. By 2006 research intensity had increased further to 2.39% compared to the OECD average of 2.26%. Singapore is also Australia's main collaborative partner in ASEAN, and joint papers with Singapore outnumber those with some significant and emerging science producers such as Korea and India, although still well below major partner countries such as China, the USA, major European nations, Canada and New Zealand. For many survey respondents (although not CSIRO), Singapore is their primary research partner in ASEAN, as well as a major educational program partner. Private sector partners play a relatively significant part in Australian collaborations with Singapore. The entire spectrum of the sciences is covered in Australia-Singapore collaborations, with biotechnology and health, physics, engineering and information sciences the largest areas of research. There have been only a small number of applications for Departmental funding assistance through International Science Linkages (ISL) as noted in the main DIISR submission. Fewer Australian organisations have seen a need for formal agreements with Singaporean counterparts than with Indonesia, Malaysia or Vietnam. These facts may indicate that research collaborations with Singapore require comparatively less government assistance and intervention than with other ASEAN countries. This is supported by anecdotal evidence from other recent discussions with stakeholders.

## **Thailand**

Thailand has a modest science sector but is a favoured ASEAN partner for Australian researchers. Universities reported collaborative research in a wide range of fields across the physical sciences, life sciences, mathematical and information sciences, business and economics and the humanities. CSIRO and many medical research institutes also reported moderate levels of collaboration with Thailand in health, and CSIRO also in agriculture.

## **Vietnam**

Vietnam has a science sector and joint publication rate with Australia similar to the Philippines, but more respondents indicated deeper collaboration. In addition to many aid-based programs, a majority of the medical research institutes also indicated at least minimal engagement in health research. Several Australian universities deliver aid-based programs in Vietnam, and many engage in collaborative research in agriculture and health. There are also some collaborations in areas such as fisheries, environment, IT, business and economics, engineering, physics and the humanities. CSIRO identified significant collaboration with Vietnamese PFROs in agricultural research. A large number of institutes have formal agreements with Vietnamese partners.

## **Multilateral**

Some respondents, particularly ANSTO and AIMS, deliver most of their programs in the ASEAN region through multilateral arrangements. These arrangements also include universities involved in region-wide fruit fly control research, environmental governance and sustainable development programs, urban planning, and various humanities research programs. The Coral Triangle Initiative is a major marine science program that includes AIMS and university involvement. Medical research institutes participate in multilateral health research. CSIRO conducts minimal research collaboration under the auspices of the Mekong Commission.

# Science and Technology Engagement with ASEAN Nations



**Australian Government**

**Department of Innovation  
Industry, Science and Research**

Organisation:	
Contact person:	
Address:	
Phone Number and Email:	

Questions		Please select the checkbox that best describes your current engagement and/ or provide details.  <i>To select the checkbox electronically, double-click the box and choose "Checked".</i>	Brunei Darussalam	Cambodia	Indonesia	Laos	Malaysia	Myanmar	Philippines	Singapore	Thailand	Vietnam	Multilateral*	
1	What <b>level of interaction</b> does your institution have with each of these countries?*( <i>select only one option for each country</i> )	Nil	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Minimal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Moderate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Significant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	What is the <b>type of interaction</b> ? <i>(can select more than one option)</i>	Education	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Collaborative research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Aid-based	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	What <b>types of institutions</b> do you interact with? <i>(can select more than one option)</i>	Universities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Publicly-Funded Research Organisations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Private/ Industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Not-for-profit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	Does your institution have an <b>MOU</b> or other formal agreement with any institution in this country?	Yes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		No	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5	If your institute is involved in <b>collaborative research</b> , what are the <b>significant fields</b> ? <i>(Please name the field/s of research (e.g. physics, geography, economics) for each country)</i>													
6	Additional comments <i>(if desired)</i>													

\* For explanation of categories please see attached notes.



*\* Notes on categories:*

Minimal: Sporadic engagement with a few projects of limited size and scope over the last five years.

Moderate: Regular engagement with frequent small to medium projects or a few large projects (over A\$1 million) over the last five years.

Significant: Ongoing high-volume interaction in a wide variety of fields.

Multilateral: 1) An international organisation formed between three or more nations to work on common issues relating to all members, in this case including Australia and a number of ASEAN member countries, or  
2) An ASEAN organisation not associated solely with a single ASEAN member country, such as the ASEAN Committee on Science & Technology.