




Submission No 2

Inquiry into Australia's Relationship with Malaysia

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Joint Standing Committee on Foreign Affairs, Defence and Trade

Historical Relationship

CSIRO's relationship with Malaysia was initially founded on development assistance, particularly as Malaysia moved to diversify its agricultural production and lessen its reliance on plantation crops. Since those early interactions, CSIRO's relationship with Malaysia has evolved with Malaysia's science capabilities.

During the 1960's and 1970's, CSIRO was heavily engaged with Malaysia through the Colombo Plan under which we took on a number of trainees and provided advice to Malaysia on a range of matters. These included the establishment of a Unit of Applied Geology in the University of Malaya; the establishment of the Animal Research Institute in Kluang; as well as the secondment of a number of technical experts and feasibility studies for the Forestry Department, Sarawak.

A longer term interaction with the Sarawak Forest Department and the Sarawak Timber Industry Development Corporation also began under the Colombo Plan in 1976, funded by the Australian Development Assistance Bureau (ADAB). This interaction was focussed on testing timbers in the Sarawak region for their suitability for pulping and papermaking. As three quarters of this region was covered in forests, the potential to develop a local forest-based industry was significant, with an important element of the project focused on training Malaysian staff. By the end of 1979 the Sarawak region had begun to export woodchips for papermaking. In 1980, ADAB funding for the project ended, but convinced of the need for further work, the Malaysians themselves continued to fund this collaboration with CSIRO.

Other collaborations during this period include a joint project designed to help establish a viable beef industry in Malaysia with the Malaysian Agricultural Research and Development Institute (MARDI) between 1973 and 1978 and the development of a major breeding and progeny testing programme of Australian Milking Zebu (AMZ) cattle with the Malaysian Department of Veterinary Services (Farm Division) between 1979 and 1987.

One of CSIRO's most significant collaborations with Malaysia has been in relation to the Nipah virus. In 1998-99, an outbreak of a previously unrecorded viral disease killed more than 100 people and thousands of pigs in Malaysia. CSIRO scientists played a key role in diagnosing and describing the disease in pigs, undertaking animal post mortems and collecting blood samples from pigs and other animals, as well as developing a blood test to show if the animals had been exposed to the virus. CSIRO scientists assisted the Malaysian Veterinary Services Department design the national surveillance and eradication program for the disease in livestock, based on the detection and culling of infected pigs. Over 30,000 pig blood samples from more than 800 pig farms nationwide were screened as part of the surveillance strategy for the Nipah virus.

This work was significant both in terms of diagnosing the virus, developing preventative techniques and helping halt its spread in Malaysia, but this work was also vitally significant in preventing the spread of this disease to the neighbouring region and Australia

Since then a major collaborative project on the Nipah virus was developed under a grant from the National Institute of Health (USA) Fogarty International Center's Emerging Infectious Disease Initiative, involving researchers from the Centers for Disease Control, CSIRO, University of Malaya, Queensland Department of Primary Industries, the Veterinary Research Institute (Malaysia), Princeton University, Harvard Medical School, and the Institute of Zoology (London). Recent research has identified fruit bats as a host and potential source of a number of emerging infectious diseases affecting animal and human populations. Work with Malaysia involved collecting of bats, bat sera and the development of diagnostic assays to determine whether pressure on fruit bat habitat and populations from deforestation and hunting altered the distribution, movement and concentration of infected bats, prior to the 1998-1999 outbreak; whether factors such as the expansion of fruit orchards and intensification of pig farming altered the distribution of food available to bats, causing them to aggregate in larger numbers; and whether these factors then provided the ideal environment for a change in host-pathogen dynamics allowing the virus to cross species and become epidemic in pigs.



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Other recent collaborations with Malaysia include:

- In July 2000, CSIRO completed a six year activity in Malaysia working on the Old World Screw-worm Fly (*Chrysomya bezziana*). These flies are a major pest of livestock in the tropics of Asia, whose maggots feed on the living flesh of warm-blooded animals, including humans. The main aim of this activity was to test the efficacy of the sterile insect release method (SIRM) in eradicating this insect if it ever entered Australia. In 2000 the estimated cost of such an outbreak was \$280m per year for the livestock industry in direct producer costs alone. One element of this activity saw the opening of a pilot facility in April 1997 in Johor, Malaysia to mass rear and release ten million sterile flies in Malaysia per week in an effort to determine how successful the "sterile release method" was in controlling and eradicating this pest. As a result of this work, a SIRM eradication program is expected to be implemented in Australia in response to any incursion by the Old World Screw-worm fly.
- For a decade from the early 1990s CSIRO collaborated with the Malaysian Meteorological Service on measurement of acid deposition and air quality at a number of sites in metropolitan Kuala Lumpur, as well as at a regional site in the Cameron Highlands, at Tanah Rata. This relationship has produced high profile international publications and led to the transfer of Australian technology to the Malaysian Meteorological Service.
- Between 1998 and 2000, CSIRO was involved in an investigation into the cause of haze in Malaysia's Klang Valley, in conjunction with the Department of Environment Malaysia, the Malaysian Meteorological Service and Alam Sekitar Malaysia Sdn Bhd. The investigation was prompted by increasing levels of smog which were thought to be the result of forest fires on the Indonesian island of Sumatra. Three major contributors to the haze independent of the Sumatran fires were identified; domestic fires; cars, and secondary particle pollution, resulting in several recommendations to help Malaysian authorities deal with domestic pollutions sources, including the development of policies to control biomass burning and the reduction of vehicle emissions.
- In recent years CSIRO has provided state of the art equipment, training and support services to the Malaysian Meteorological Service for the establishment of its Global Atmosphere Watch observatory in the Danum Valley, Sabah, as the Malaysian contribution to the global World Meteorological network of such observatories.
- By 1991 the Terubok species of fish, the national fish of the east Malaysian state of Sarawak was close to extinction, primarily due to overfishing. From 1993, for approximately ten years, CSIRO was involved in a collaborative project with the Sarawak State Government of Malaysia aimed at the management and conservation of this fishery. Within one year of starting the project, the research team led by CSIRO had discovered three vital things about the fish: it only lives for two years, changes sex (it changes from male to female at two years of age), and only spawns in three very specific localities. This knowledge has enabled the Sarawak Government to institute suitable management for the fishery and, in collaboration with CSIRO, to culture the species. The culture of large numbers of fingerlings and the re-seeding of estuaries, together with various management strategies, have now saved the species from extinction.
- From 1997-2001 CSIRO studied the effects of mangrove removal on the productivity of estuaries in Malaysia, and in particular the consequences for prawn fisheries. This project was undertaken in collaboration with Fisheries Research Institute, Malaysia; the University Sains Malaysia, Malaysia and Griffith University, Australia and provided information beneficial to fisheries managers in both countries. The study found a positive relationship between the commercial banana prawn catch and the extent of mangrove vegetation in all states of Malaysia, with a loss of mangroves expected to lead to a reduction in prawn catch. It also found that the maintenance of the shallow fringes of estuaries is important to the commercial catch of white prawns. Researchers found little conclusive evidence that mangrove loss altered nutrient concentrations in mangrove waterways, but nitrogen pollution was evident near populated areas. This work was undertaken in partnership with the Australian Centre for International Agricultural Research (ACIAR).



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- Scientists from CSIRO's Australian Animal Health Laboratory (AAHL) in Geelong, Victoria, collaborated with the United Nations' Food and Agriculture Organisation (FAO) to provide crucial training to Thailand, Malaysia, Singapore, Indonesia, Laos and Vietnam in diagnosing bird 'flu. This helped stop the spread of bird 'flu in Asia and thereby reduce the risk of it reaching Australia.

Current Relationship

CSIRO continues to collaborate with Malaysia in a variety of ways, including one-to-one interactions on specific projects, information and staff exchanges, as well as in broader multilateral contexts – both on specific projects or in multilateral forums, including ASEAN. CSIRO's interactions cover agribusiness; environment and natural resources; manufacturing and construction; minerals and energy; and medical and health sciences.

From 1997 to 2001, Malaysia ranked between 7th and 12th in the world in terms of the number of international interactions with CSIRO. This ranking decreased to 17th in 2002 and 18th in 2004. In 2005, Malaysia resumed a ranking of 12th. Recent visitors from Malaysia included a visit to our Black Mountain laboratories in April 2005 by the Prime Minister of Malaysia, the Honourable Abdullah Badawi and Dr Shukor of the Malaysian Agricultural Research and Development Institute.

As stated previously, much of CSIRO's early interactions with Malaysia were based on development projects through Australia's aid program. As such, part of Malaysia's ranking fluctuation can be attributed to the changing nature of CSIRO's relationship with Malaysia, mirroring to an extent Malaysia's transition from an Australian aid recipient to a partner country and a contractor or purchaser of research. This has been particularly evident in the Division of Petroleum Resources which saw a marked increase in contract research with Malaysia during 2005.

CSIRO has established a number of more formal mechanisms for interactions with Malaysia. These include:

- A Memorandum of Understanding signed in May 2003 with Petronas Research and Services Sdn Bhd (PRSS).
- A Relationship Agreement in August 2001 with the Malaysian Palm Oil Board (MPOB).
- A Letter of Agreement was signed in June 1998 between Universiti Putra Malaysia (Serdang, Selangor) and CSIRO to facilitate ongoing interactions in the field of human nutrition.
- A Scientific and Technological Cooperation Agreement with the Council of the Standards and Industrial Research Institute of Malaysia (SIRIM, now known as SIRIM Berhad) in 1993 which resulted in collaboration between CSIRO and SIRIM on the standardisation of the Malaysian building code; and other metrology areas.
- A Relationship Agreement signed in July 2000 with SCS Computer Systems Sdn Bhd.

In 2003, SIRIM Berhad (formerly the Standards and Industrial Research Institute of Malaysia), along with CSIRO and seven other international research organisations, established the Global Research Alliance (GRA) which aims to facilitate international research and development cooperation in an effort to address the problems facing the world especially in the areas of water, health, energy, transportation and digital divide. For example, the GRA has developed a water resources strategic plan of action for the ASEAN region that recognises drivers such as climate change, environmental risk, safe drinking water and sanitation, in-country capacities and future sectoral demand and at the same time delivers some real outcomes in terms of building capacity within ASEAN member nations.

Building on the previous work on the Nipah and Hendra viruses, an important current collaboration between CSIRO's AAHL and the Universiti Pertanian Malaysia has identified a new virus from bats (Pulau virus). Virological studies of newly-emerging viruses with potential to infect humans are continuing.



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Other research activities with which CSIRO is currently collaborating with Malaysian researchers are:

- A project investigating the phylogeny/taxonomy of the termite genus *Coptotermes*. This genus includes some of the most invasive termite species known, making it in economic terms the most important termite genus in the world. This activity includes examination of resistance of reference plastic materials to attack by different species of *Coptotermes* and experiments on wood consumption/survival and colony interactions with different species of *Coptotermes*.
- Development of treatments for the Nipah and Hendra virus.

CSIRO continues to have strong interactions with the Malaysian Palm Oil Board (MPOB then PORIM), in terms of research collaboration and in relation to policy. Professor Maryann Augustin, Senior Principle Research Scientist in Food Science Australian was appointed a Member of the Scientific Advisory Committee for the Malaysian Palm Oil Board. This is a high-level Advisory Committee comprising experts of international standing. The Committee meets once a year for a week to review the Research Program of the Malaysian Palm Oil Board. Current research collaboration is focused on the development of a novel water soluble antioxidant mixture recovered from the biowaste generated during the extraction of palm oil. This biowaste accounts for almost twice the tonnage of the extracted oil. At present, Malaysia produces over 12 million metric tonnes (MMT) of crude palm oil annually yielding almost 25 MMT of this waste liquor which has traditionally been regarded as a pollutant and therefore a major burden to the palm oil industry. Therefore, if successful, the present field of research has the potential to expand rapidly with opportunities for further work and commercial exploitation.

CSIRO has also had a strong and fruitful collaboration with the Department of Food Science and Biotechnology, Universiti Putra Malaysia (UTP) which peaked around 2000-2004. The interactions included training and supervision of post-graduate students at the CSIRO Human Nutrition laboratories in Adelaide as well as other academic linkages including lectures, scientific seminars as well as joint sponsorship of a conference and workshop on Functional Foods (held in Kuala Lumpur in 2001). The collaboration with UPM was assisted in part by the now defunct CSIRO International Collaboration Scheme (2001/03), and Professor Suhaila Mohamed was assisted by the Malaysian authorities under the Malaysia-Australia Science and Technology Bilateral Cooperation- "Assessment of Potential Health Benefits of Malaysian Plants and Micro-organisms". While these academic links are still intact, presently there are no active collaborative projects between the partners, due largely to lack of funds.

Conclusion

Malaysia will continue to be an important partner for CSIRO in South East Asia. In 2005, the only ASEAN country to undertake more collaborative activities with CSIRO was Indonesia, approximately one quarter of which were funded through Australia's aid programs. This positions Malaysia well as a scientific partner in the region and a source of scientific knowledge, people and innovation.

CSIRO's relationship with SIRIM Berhad through the Global Research Alliance will also further strengthen these linkages. In the immediate future it is anticipated that collaboration in the areas of tropical agriculture, food and nutrition (including "food" nanotechnology and the delivery of bioactives), mining and information and communication technology (ICT) will continue and other opportunities will be explored as they arise. Malaysia will also continue to be an important partner in the surveillance and diagnosis of emerging infectious diseases in the region.

It is pleasing to welcome the initiative of the Australia-Malaysia Institute to invite a group of Malaysian science journalists in May 2006 to Australia. The tour by the journalists of CSIRO laboratories in Sydney and Canberra resulted in much publicity for CSIRO in Malaysia and helped improve Australia's image in Malaysia.