



Forschungspräsenzen internationaler Akteure in Asien

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Berichterstattung zur Forschungs-, Bildungs-, Technologie- und Innovationspolitik weltweit

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Editorial

In der vorliegenden achten Schwerpunktausgabe des *ITB infoservice* „Forschungspräsenzen internationaler Akteure in Asien“ stellen wir Ihnen ausländische Strategien und Beispiele zum Aufbau sichtbarer Forschungspräsenzen in Asien vor. Derartige Kooperationen sind ein zunehmend wichtiger Bestandteil der Internationalisierung von Forschungsorganisationen und Universitäten. Bereits seit Anfang des 20. Jahrhunderts gibt es Präsenzen europäischer Forschungseinrichtungen in Asien, Afrika und Lateinamerika. Traditionell war deren Gründung durch den Wunsch getrieben, Zugang zu lokalen Untersuchungsgegenständen zu sichern. Der Trend zum Aufbau von Forschungspräsenzen hat sich allerdings in den letzten 10-15 Jahren deutlich verstärkt. Hierbei kommen neue Akteure auf den Plan und die Motive für die Gründung solcher Einrichtungen haben sich diversifiziert. Im besonderen Fokus steht Asien – offensichtlich hat die Dynamik des asiatisch-pazifischen Forschungsraumes den Trend zur Gründung von Forschungspräsenzen maßgeblich beeinflusst.

Der einführende Artikel gibt Ihnen zunächst einen Überblick über die Aspekte und Instrumente der Internationalisierung sowie die Entwicklung von Präsenzen im Ausland und ihre Relevanz in der Forschung.

Im darauf folgenden Abschnitt werden die strategischen Überlegungen entscheidender Institutionen, ihre Motivation, rechtliche Rahmenbedingungen, genutzte Ressourcen und Perspektiven betrachtet. Hier wird das Thema aus europäischer Sicht anhand von Beispielen aus der Schweiz, Frankreich, Belgien und Dänemark beleuchtet.

Anschließend geht es um den asiatischen Blickwinkel. Hier werden die Strategien und Motivation zur Gewinnung ausländischer Forschungspräsenzen zum Beispiel über die erfolgreiche Etablierung von Clustern und das CREATE-Programm in Singapur vorgestellt.

Abschließend folgen Beispiele erfolgreicher internationaler Kooperationen mit Präsenzen in Asien wie zum Beispiel VTT Korea, einem erfolgreich agierenden finnischen Satelliten vor Ort.

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Ausführliche Länder- und Themeninformationen bei Kooperation international

Fokus China

→ <http://www.kooperation-international.de/china>

Fokus Indien

→ <http://www.kooperation-international.de/indien>

Fokus Republik Korea (Südkorea)

→ <http://www.kooperation-international.de/suedkorea>

Fokus Singapur

→ <http://www.kooperation-international.de/singapur>

Fokus Taiwan

→ <http://www.kooperation-international.de/taiwan>

Fokus Thailand

→ <http://www.kooperation-international.de/thailand>

Fokus Vietnam

→ <http://www.kooperation-international.de/vietnam>



Einführung

Präsenz im Ausland als Instrument der Internationalisierung von Forschungseinrichtungen

Betrachtet man die Internationalisierung von Forschung, kann man sich dem Thema auf sehr unterschiedliche Weise nähern. Dazu gehört auch die Präsenz von Forschungseinrichtungen im Ausland. Diese war in der Regel direkt an einen bestimmten Forschungsgegenstand gebunden, der im Heimatinstitut nicht oder nicht gut untersucht werden konnte. In den vergangenen zehn Jahren ist eine zunehmende Einrichtung von Präsenzen aus strategischen und wettbewerbsfähigen Gründen zu beobachten.

Wenn von zunehmender Internationalisierung gesprochen wird, bezieht man sich häufig auf gemeinsame Organisations- und Infrastrukturen, neue Kooperationsformen oder die Mobilität von Forscherinnen und Forschern. Vorangetrieben wurde diese Entwicklung unter anderem durch die wirtschaftliche Entwicklung in vielen Teilen der Welt und der damit verbundenen wachsenden

den Bedeutung von Wissenschaft und Forschung. Weitere Indikatoren der fortschreitenden Internationalisierung sind die Zunahme der weltweit tätigen Wissenschaftlerinnen/Wissenschaftler und Forscherinnen/Forscher und der damit verbundenen Wissensproduktion sowie ein starker thematischer Differenzierungs- und Spezialisierungstrend. Der Anteil der internationalen Ko-

Publikationen an den veröffentlichten wissenschaftlichen Artikeln weltweit wächst stetig. Gleichzeitig gibt es eine positive Korrelation zwischen internationaler Zusammenarbeit, internationaler Mobilität von Wissenschaftlern und Zitierhäufigkeit der Publikationen (OECD STI Scoreboard 2013).

Die nach dem zweiten Weltkrieg einsetzende neue Entwicklung der Internationalisierung der Hochschulen und Forschungseinrichtungen bezog sich in der ersten Phase im Wesentlichen auf den Studierenden- und Forschungsaustausch. Waren zu Beginn noch ausschließlich nationale Förderorganisationen aktiv, kamen später die europäischen Bildungsprogramme ERASMUS und SOKRATES

hinzu. Seit den frühen 60er Jahren des letzten Jahrhunderts ist die internationale Forschungszusammenarbeit auch Gegenstand zahlreicher Regierungsabkommen zur wissenschaftlich-technologischen Zusammenarbeit (WTZ).



In den 1990ern begann sowohl auf der nationalen Ebene als auch zunehmend auf der europäischen Ebene das Thema Internationalisierung als Wettbewerbs- und Standortfaktor immer wichtiger zu werden. Der Bedeutungszuwachs der Fördermittel der EU-Forschungsrahmenprogramme und die zunehmende Beteiligung führten sogar innerhalb von Europa zu einer Diskussion über *Brain Drain* versus *Brain Circulation*.

Die Vernetzung der europäischen Wissenschaft und Forschung wurde in Deutschland durch die zunehmende Förderung von Verbundvorhaben vorangetrieben, in Europa vor allem durch die bis heute bedeutenden EU-Rahmenprogramme. Der Bolognaprozess und die weltweite Akzeptanz des Englischen als Lehr- und Forschungssprache an Hochschulen und Forschungseinrichtungen beschleunigte die internationale Öffnung der Hochschulen. Die Folge war eine Verbesserung der Service-Angebote an deutschen Hochschulen für Ausländerinnen und Ausländer, ein gezieltes Marketing zur Anwerbung ausländischer Studentinnen/Studenten und Forscherinnen/Forscher sowie förderliche Rahmenbedingungen für Rückkehrende.

Es steht heute außer Frage, dass sich eine moderne Industriegesellschaft nur auf der Grundlage einer aktiven Forschungs- und Innovationslandschaft weiterentwickelt. Der globale Wettbewerb um die besten Köpfe und Inhalte führt zur Frage, wo Köpfe zu erreichen sind, exzellente Inhalte entwickelt werden und die modernste oder vielfältigste Infrastruktur zur Verfügung steht. Damit stellen sich auch Fragen nach einer stärkeren Forschungs Kooperation und/oder Akquisetätigkeit (für Personal, Aufträge, Finanzen und Inhalte) mit dem Ausland oder nach einer eigenen Präsenz im Ausland für viele Einrichtungen neu.

Was ist eine Auslandspräsenz?

Der Begriff der Auslandspräsenz umfasst sowohl repräsentative Funktionen als auch wissenschaftlich-forschende Tätigkeiten. Ihren Funktionen nach können diese gruppiert werden in

1. Präsenzen mit rein repräsentativer Funktion,
2. Projektbezogene Forschungspräsenzen mit sowohl wissenschaftlicher als auch repräsentativer Funktion, im Wesentlichen zeitlich befristet und projektfinanziert,

3. „institutionelle“ Forschungspräsenzen mit eigener Rechtsform und langfristig ausgerichtet.

1 und 3 beinhalten meist physische Präsenzen mit eigenen Räumlichkeiten, ggf. Laboren, eigenem Personal und im Falle der Forschungspräsenz häufig einer Kofinanzierung von ausländischer Seite. Die Kategorie der „projektbezogenen Forschungspräsenzen“ umfasst hier sämtliche inhaltlich, zeitlich und finanziell von Beginn an als befristet angelegten Formen der Kooperation. Die Übergänge zwischen den Kategorien sind oft unscharf und das Verhältnis zwischen wissenschaftlichem und repräsentativem Charakter der Kooperation ist dabei flexibel, das heißt auch eine nahezu rein wissenschaftliche Ausrichtung ist möglich. Virtuelle Plattformen der Kooperation, langfristig angelegte Kooperationsstrukturen ohne eigene Räumlichkeiten oder eigenes Personal sind eher den projektbezogenen Forschungspräsenzen zuzuordnen. Während die Repräsentanz in der Regel mit geringem Personalaufwand Unterstützung für die Heimatorganisation anbietet, sind die anderen Formen mit entsandtem und lokalem Personal ausgestattet und selber forschend und ausbildend aktiv.

Außeruniversitäre Forschungsorganisationen arbeiten eher mit echten Forschungspräsenzen, wenn auch begrenzt und mit unterschiedlichen Ansätzen, während die Universitäten noch im Wesentlichen auf Repräsentanzen und Kooperationen mit Partneruniversitäten setzen. Beide Seiten, Universitäten und Forschungsorganisationen, nutzen aber jeweils auch die anderen Formen. Dabei ist die gewählte Organisationsform nicht nur abhängig von der Struktur, der Finanzierung und dem nationalen Auftrag der Heimatinstitution. Bei Einrichtungen wie dem französischen CIRAD (Centre de coopération internationale en recherche agronomique pour le développement) oder IRD (Institut de recherche pour le développement) ist der Auftrag „Internationale Agrarforschung für Entwicklung“ bzw. „Forschung für Entwicklung“ eindeutig verbunden mit der Präsenz in den Zielländern. Auch die Bedingungen im Zielland sind entscheidend für die gewählte Form. So muss zum Beispiel die Frage nach einer echten eigenen Präsenz mit allen damit verbundenen Pflichten (Steuer, Arbeitsrecht) und Nutzen (eigene Personalrekrutierung, Unabhängigkeit, wirtschaftliche Tätigkeit) gegenüber einer Partnerschaft mit einer lokalen Einrichtung (mit weniger Pflichten und geringerer Eigenständigkeit) abgewogen werden.

Die EU-Delegation in China hat in Kooperation mit EURAXESS Links, dem EU-China IPR Helpdesk und EU SME eine Broschüre zu Formen von und Wegen zu europäischen Präsenzen in China erstellt, die die oben aufgeworfenen Fragen systematisch durchgeht und versucht, Antworten zu geben. Allerdings beschränkt sich die Broschüre auf Partnerschaften, die im Wesentlichen von der chinesischen Seite finanziert werden. Die Vor- und Nachteile sind jeweils für das Zielland und die entsendende Organisation spezifisch zu ermitteln.

Für Repräsentanzen mit entsandtem Personal der Organisation, für zeitlich begrenzte Projekte oder für die Nutzung von Feldlaboren in Kooperation mit einer Gastuniversität ist eine eigene Rechtsform häufig nicht notwendig. Will man im Ausland jedoch selbstständig agieren können (Personal einstellen, wirtschaftlich tätig werden, ausländische Drittmittel einwerben), so ist in der Regel eine eigene Struktur nach ausländischem Recht erforderlich. Die Niederlassung der Technischen Universität München TUM in Singapur wurde erst durch die eigene Rechtsform vom singapurischen Staat als Ausbildungsstätte anerkannt und konnte so Mittel in Singapur einwerben. In ähnlicher Weise kann das KIT China nur dank seiner chinesischen Rechtsform Personal einstellen.

Welche Auslandspräsenzen gibt es?

Es gibt weltweit keine einheitliche Entwicklung der Auslandspräsenzen von Forschungseinrichtungen. Zu unterschiedlich sind die jeweiligen historischen Grundbedingungen und aktuellen Systeme. Allgemein lässt sich sagen, dass bisher nur wenige nationale Forschungseinrichtungen aus wenigen Ländern überhaupt echte Auslandsforschungspräsenzen aufgebaut haben. In der Regel bleibt es bei Repräsentanzen. Vor allem die angelsächsischen Hochschulen werden durch Ausbildungspräsenzen im Ausland sichtbar.

In Deutschland haben die in der Max Weber Stiftung zusammengefassten Deutschen Geisteswissenschaftlichen Institute im Ausland teilweise eine lange Tradition. Seit dem Jahr 2001 fördert das BMBF über den DAAD mit dem Programm „Studienangebote deutscher Hochschulen im Ausland“ die Hochschulen zur Gründung von struktureller langfristig angelegter Kooperation mit dem Ausland. Gleichzeitig entwickeln sich, neben den wenigen durch das Forschungsthema bestimmten Auslandsstandorten (z. B. Polarforschung, Radioteleskope,

Primatenforschung), aus internationalen Forschungsprojekten immer wieder längerfristige Engagements im Ausland.

In anderen europäischen Ländern sind teilweise koloniale Strukturen weitergeführt worden, so z. B. in Frankreich mit den Instituten des CIRAD (vgl. S. 11) in Afrika, Asien und Südamerika. Das französische CNRS (Centre national de la recherche scientifique) hat vor etwa 15 Jahren ein Programm aufgelegt und betreibt derzeit 25 „International Joint Units (UMI)“, die sowohl in Frankreich als auch im Ausland Forschungspräsenzen mit dauerhaften CNRS-Forschern vor Ort haben, derzeit z. B. in Hong Kong, Indien, Japan, Taiwan und Thailand. Frankreich unterhält Pasteur-Institute in Südkorea, China, Vietnam (vgl. S. 14) und Kambodscha. Selbst kleinere Länder setzen auf FuE-Präsenzen in der Region. Ein dänisches Universitätskonsortium baut zurzeit einen Forschungscampus nahe Peking auf (vgl. S. 17). Die finnische Forschungsorganisation VTT betreibt bereits einen solchen Campus in Südkorea (vgl. S. 30). Derzeit steht bei vielen dieser Auslandspräsenzen noch der Export von Bildungsangeboten im Vordergrund, zunehmend finden jedoch auch Forschung und Entwicklung statt.

Auf der europäischen Ebene sind hier die INCO-LABs zu erwähnen. In einer der letzten Bekanntmachungen des 7. Forschungsrahmenprogramms der EU wurden sechs Vorhaben ausgewählt, bei denen die Öffnung von bestehenden Auslandsniederlassungen europäischer Forschungseinrichtungen für Forscher aus anderen EU-Staaten bis zu vier Jahre gefördert wird. Dahinter steht die Hoffnung der Europäischen Kommission, dass sich aus Auslandseinrichtungen einzelner Forschungseinrichtungen europäische Verbundpräsenzen ergeben, die den Europäischen Forschungsraum auch im Ausland sichtbar machen (vgl. Infobox auf der nächsten Seite und Artikel auf S. 28).

Relevanz von Auslandspräsenzen in der Forschung für die Internationalisierung von Einrichtungen

Für privatwirtschaftliche Unternehmen ist die Verlagerung von Produktion und Forschungsaufgaben ins Ausland (*Offshoring*) seit Jahren ein normaler Vorgang. Das Ergebnis einer Studie des *Austrian Institute of Technology* von 2013 stellt klar: Es gibt einen positiven Zusammenhang zwischen *Offshoring* und der Innovationskraft eines Unternehmens. Firmen, die Teile der Produktion verlagert

INCO-LAB und INCO-HOUSE

INCO-LAB-Aktivitäten gemeinsamer Forschungsinstitute (joint institutes) werden von Partnern aus EU-Mitgliedstaaten oder Assoziierten Staaten und Drittstaaten bis zu vier Jahre lang unterstützt. Diese Institute müssen in Drittstaaten angesiedelt sein. Gefördert werden die Öffnung solcher Institute für Forscher aus anderen EU-Mitgliedstaaten oder Assoziierten Staaten, gemeinsame Seminare und Sommerschulen und die Vorbereitung der Angliederung weiterer EU-Partner an diese Institute. Von der EU-Förderung ausgeschlossen sind Institute, die ausschließlich von EU-Mitgliedstaaten oder Assoziierten Staaten oder privaten Organisationen finanziert werden. Derzeit werden sechs INCO-LABs von der EU gefördert:

IMMUNOCAN

Toward enhancing activities of European institutions in the FDUSCC-IM cancer research joint institute in China

Koordinator: Transgene SA, Frankreich

<http://www.immunocan.org>

SWAN

Sustainable Water ActioN: building research links between EU and US, Koordinator: Centre national de la recherche scientifique, Frankreich

<https://swanproject.arizona.edu>

ERUCAS

European-Russian Centre for cooperation in the Arctic and Sub-Arctic environmental and climate research

Koordinator: Scientific foundation Nansen International Environmental and Remote Sensing Centre, Russland

<http://eurucas.niersc.spb.ru>

EUJO LIMMS

EUrope-Japan Opening of LIMMS, Koordinator: Centre national de la recherche scientifique, Frankreich

<http://www.2020-horizon.com/EUJO-LIMMS-EUrope-Japan-opening-of-LIMMS%28EUJO-LIMMS%29-s2648.html>

CLIM-AMAZON

Joint Brazilian-European research facility for climate and geodynamic research on the Amazon River basin sediments, Koordinator: Institut de recherche pour le développement, Frankreich

<http://www.clim-amazon.eu>

INDO-MARECLIM

Indo-European research facilities for studies on marine ecosystem and climate in India, Koordinator: Nansen Environmental Research Centre Ltd., Indien

<http://www.indomareclim-nerci.in>

Die Förderung von INCO-HOUSEs soll die Aktivitäten der INCO-LABs ergänzen. Unterstützt werden gemeinsame Zentren (joint centres), die von EU-Mitgliedstaaten oder Assoziierten Staaten gefördert, aber in Drittstaaten angesiedelt sind und gemeinsame Forschungsprogramme in der Grundlagen- und Angewandten Forschung kofinanzieren. Die Erweiterung solcher Zentren für neue Partner aus anderen EU-Mitgliedstaaten oder Assoziierten Staaten wird über einen Zeitraum von zwei Jahren gefördert.

Nicht im Fokus der Förderung stehen Außenstellen (liaison offices) in Drittstaaten, die nationale Forschungsprogramme oder Forschungseinrichtungen in Drittstaaten bekannt machen sollen.

Derzeit wird ein INCO-HOUSE-Projekt gefördert:

INDIA SI HOUSE

India-EU Joint House for Science & Innovation

Koordinator: Observatoire des sciences et des techniques, Frankreich

<http://www.indiasihouse.eu>

haben, geben deutlich mehr für Forschung und Entwicklung (FuE) und für Produktdesign aus, bringen mehr innovative Produkte hervor und investieren mehr in Prozessinnovationen. Obwohl in neuen Zielmärkten Entwicklungsabteilungen aufgebaut wurden, wuchsen auch die Forschungsabteilungen in den Hauptsitzen bei Firmen, die Auslagerungen vornahmen, stärker als bei vergleichbaren Unternehmen ohne *Offshoring* (aus Die Presse, Print-Ausgabe, 03.11.2013: Besprochen werden Ergebnisse auf Basis des „European Manufacturing Survey“ (EMS), der detaillierte Daten von 3.100 Unternehmen in sieben Staaten untersucht).

Haben solche Erfahrungen der oben genannten „physischen Teil-Auslagerung der Innovationskompetenzen“ aus der Wirtschaft eine Bedeutung für die zunehmend wettbewerbsfähig denkenden und unter wirtschaftlichem und inhaltlichem Erfolgszwang stehenden Forschungseinrichtungen und Universitäten? Müssen große Forschungseinrichtungen Auslandspräsenzen aufweisen?

Bei der Internationalisierung von Wissenschaft und Forschung und der Präsenz im Ausland spielen in einer ersten Näherung vier Dimensionen eine besondere Bedeutung: die inhaltliche, die wissenschaftspolitische, die institutionelle und die rechtliche (Empfehlungen zur deutschen Wissenschaftspolitik im Europäischen Forschungsraum, Wissenschaftsrat, Drs. 9866-10, Berlin 02 07 2010):

(1) Die inhaltliche Dimension, also die fachlich sinnvolle Kooperation mit Partnern im Ausland, beispielsweise aufgrund der Exzellenz der Partner, der geographischen Gegebenheiten oder einzigartiger Forschungsinfrastruktur, ist die schon immer sichtbare Kerndimensionen und ist auch nach wie vor der Haupttreiber von Auslandspräsenzen. Kooperation und auch Präsenz folgen demnach der fachlichen Ausrichtung einer Einrichtung.

(2) Die wissenschaftspolitische Dimension berücksichtigt die Frage, welchen Stellenwert Forschung in einem Staat hat und welche politische Bedeutung dabei die internationale Zusammenarbeit hat. In Europa sind die Integrationsprozesse, der Bolognaprozess in der Bildung, die Vollendung des Europäischen Forschungsraums in der Forschung oder auch die Einrichtung von multinationalen Großforschungseinrichtungen politische Entscheidungen, die die Internationalisierung stark vorantreiben. Singapur ist die Blaupause für eine weitgehend

politisch entschiedene und vorangetriebene Entwicklung einer Stadt zu einem der führenden Forschungsstandorte der Welt, die hauptsächlich von ausländischen Forschern betrieben wird, mit vielen FuE-Präsenzen privater und öffentlicher ausländischer Einrichtungen an singapurischen Forschungseinrichtungen (u. a. Technische Universität München, Massachusetts Institute of Technology, Georgia Tech, University of Newcastle).

(3) Die institutionelle Dimension befasst sich mit Organisationsformen, Einrichtungen und Programmen. Die zunehmende Bedeutung von Kooperation bewegt auch Institutionen zur Internationalisierung und zur internationalen Präsenz, die nationalstaatlich gebunden sind und einen nationalen Auftrag haben. Das sind die Universitäten in Europa oder auch die Forschungseinrichtungen mit nationalem Auftrag, darunter CNRS in Frankreich, die Niederländische Organisation für Angewandte Forschung (TNO) oder die Fraunhofer-Gesellschaft, die Helmholtz-Gemeinschaft und die Leibniz-Gemeinschaft in Deutschland. Dabei stehen die öffentlich geförderten Einrichtungen vor der Herausforderung, ihren nationalen Auftrag mit den zunehmend internationalen Rahmenbedingungen intelligent zu verbinden.

(4) Vor allem durch die institutionelle Dimension werden vielfältige rechtliche Fragen der Internationalisierung aufgeworfen, die zum Teil auf nationaler Ebene bearbeitet werden müssen, zum Teil bilateral zwischen Staaten vereinbart (z. B. Forschervisa oder Zugang zu Material), innerhalb der EU aber auch auf europäischer Ebene bearbeitet und beantwortet werden müssen. Für die Mobilität von Forscherinnen und Forschern stellen z. B. die EURAXESS-Initiativen „Jobs“, „Services“ und vor allem „Rights“ einheitliche Rahmenbedingungen zur rechtlichen Absicherung von mobilen Forscherinnen und Forschern in Europa zusammen. Bei Auslandsgründungen von Forschungsorganisationen entstehen, in Abhängigkeit von der gewählten eigenständigen oder partnerschaftlichen Struktur, Fragen zum Arbeitsrecht, Vertragsrecht, Versicherungsrecht, und Schutz des geistigen Eigentums.

Eine Reihe von deutschen Forschungseinrichtungen steht heute vor der Frage, wie (bestehende) Präsenzen in eine strategische Ausrichtung der Organisation zur internationalen Zusammenarbeit eingepasst werden. Die Überlegungen zur

Auslandspräsenz erfordern eine Berücksichtigung aller oben genannten Dimensionen: Wissen wir genau, wo unsere fachlichen Schwächen und Stärken sind und wissen wir, wo auf der Welt komplementäre Inhalte gegeben sind, mit denen wir uns verstärken können? In welchem Umfang passt eine Internationalisierung zu unserem wissenschaftspolitischen Auftrag? Haben wir die notwendige internationale Rechtskompetenz im Haus? Lassen unsere institutionellen Strukturen, von der grundsätzlichen Verfasstheit der Einrichtung bis zur Finanzadministration, überhaupt ausländische Präsenzen zu? Und hinter jeder dieser Fragen steht eine Vielzahl Einzelthemen und weiterer Fragen.

Fazit

Eine effektive Nutzung von Auslandspräsenzen wird künftig verstärkt davon abhängen, dass systematische Überlegungen zur eigenen Einrichtung, ihrer nationalen Ausrichtung, Verfasstheit und Organisationsstruktur sowie der inhaltlichen Stärken und Schwächen angestellt werden. Die Motivation für die Neuetablierung oder auch den Ausbau bestehender Präsenzen kann dabei verschiedene Aspekte beinhalten, die dann organisationspezifisch beantwortet werden müssen:

- Wissenschaftliche Wertschöpfung: Zugang zu Forschungsobjekten, personellen Ressourcen, Infrastruktur, Kompetenzerweiterung der Institution, Vernetzung mit Exzellenzzentren.
- Wirtschaftliche Wertschöpfung: Unterstützung von Unternehmen der eigenen Region, die sich im Partnerland etablieren wollen, aber auch die technologische Beratung der lokalen Industrie durch Aufträge.
- Wissenschaftspolitische Wertschöpfung: Außenwissenschaftspolitik, Präsenz als Einstieg in sonst geschlossene Wissenschaftslandschaften, als Marktöffner bei potentiellen Partnern, Wissenschaftsmarketing, Infos zu Hochschul- und Forschungspolitik.
- Umsetzung von Internationalisierungsstrategien der Institutionen.

Dr. Gerold Heinrichs

Download

OECD Science, Technology and Industry Scoreboard 2013

(Vollzugang für Abonnenten der OECDiLibrary, Leseversion für Nichtabonnenten)

→ http://www.oecd-ilibrary.org/science-and-technology/oecd-science-technology-and-industry-scoreboard-2013_sti_scoreboard-2013-en

Handbook November 2013: How to establish a Europe-China Joint Research Structure?

→ <http://ec.europa.eu/euraxess/data/links/china/docs/Handbook%20How%20to%20Establish%20an%20EU%20China%20Joint%20Research%20Structure.pdf>

Empfehlungen zur deutschen Wissenschaftspolitik im Europäischen Forschungsraum

→ <http://www.kowi.de/Portaldata/2/Resources/fp/2010-Empfehlungen-Wissenschaftsrat-ERA.pdf>

Weitere Informationen

Deutsche Geisteswissenschaftliche Institute im Ausland der Max Weber Stiftung

→ <http://www.maxweberstiftung.de/institute.html>

Studienangebote deutscher Hochschulen im Ausland

→ <https://www.daad.de/hochschulen/hochschulprojekte-ausland/studienangebote-deutscher-hochschulen-im-ausland/05106.de.html>

Centre de coopération internationale en recherche agronomique pour le développement (CIRAD)

→ <http://www.cirad.fr>

International joint units (UMI)

→ <http://www.cnrs.fr/en/workingwith/UMI.htm>

Die Presse: Warum Offshoring nichts Schlechtes sein muss

→ <http://diepresse.com/home/wirtschaft/international/1471561/Warum-Offshoring-nichts-Schlechtes-sein-muss>

European Manufacturing Survey

→ <http://www.isi.fraunhofer.de/isi-de/i/projekte/fems.php>

EURAXESS-Initiativen Jobs, Services, Rights

→ <http://ec.europa.eu/euraxess/index.cfm>

Die Strategie der ETH Zürich für das Singapore-ETH Centre

Die Eidgenössische Technische Hochschule (ETH) Zürich wurde 1855 gegründet und war von Beginn an eine international ausgerichtete Hochschule. Ein Großteil der Professorenschaft und der Studierenden stammte aus Deutschland, Nordeuropa, Russland, und den Ländern der KuK Monarchie. Zu Beginn des 20. Jahrhunderts erreichte diese Entwicklung ihren Höhepunkt.

Heute kommen circa 20 % der Bachelor-Studierenden, 35 % der Master-Studierenden, 65 % der Doktorierenden und der Professorenschaft aus dem Ausland. Damit ist die ETH Zürich eine der Universitäten mit der stärksten internationalen Ausrichtung. Im Inland ist sie für ihre Lehre und Umsetzungsstärke bekannt, im Ausland eher für ihre Leistungen in der Forschung und Entwicklung.

Nachdem die ETH Zürich die traditionelle Internationalisierung seit ihrer Gründung als Teil ihrer Strategie nutzte, entwickelte sie seit 2006 eine weitere Ebene: das direkte Engagement im Ausland. Bereits zu diesem Zeitpunkt pflegte die Professorenschaft – etwa 300 – wissenschaftliche Kontakte und Zusammenarbeit mit mehr als 3.000 ausländischen Partnern und Institutionen. Es zeigte sich, dass sich die an der ETH entwickelten Grundlagen und Methoden zur Bearbeitung der großen Herausforderungen in anderen Regionen der Welt sehr wohl eignen würden, dass aber die mangelnde Präsenz an diesen Orten der Umsetzung im Weg stand.

In der ETH bildeten sich im Verlauf der kommenden Jahre durch interne und externe Einflüsse drei Ebenen heraus, die institutionell zunehmend zusammengefasst wurden. Die erste, individuelle Ebene ist diejenige der Professorinnen und Professoren, ihrer Mitarbeitenden und Studierenden. Sie pflegen hauptsächlich individuelle Kontakte zu anderen Forschenden und Studierenden weltweit. Beispielsweise zeigte sich, dass sich zwischen der ETH und Universitäten in Singapur bereits seit Mitte der Neunzigerjahre eine wachsende Zusammenar-

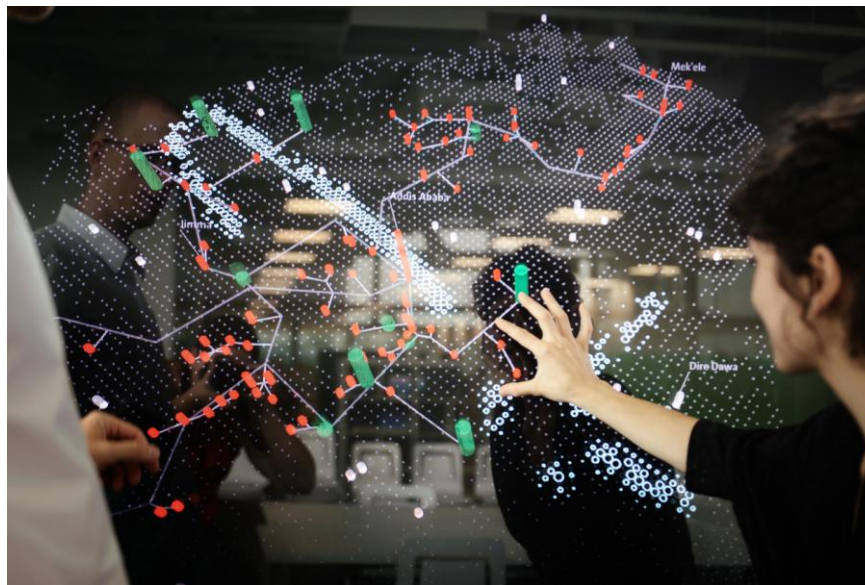
beit im Bereich Studierendenaustausch und Forschung entwickelte. Die zweite Ebene ist diejenige der ETH Schulleitung und ihrer Mitarbeitenden, die Netzwerke aufbauen und pflegen und so den Weg für den individuellen Austausch ebnen. Auf dieser Ebene wurden die Universitäten in Singapur seit 2005 sehr aktiv und suchten die Zusammenarbeit mit der ETH. Die dritte Ebene ist diejenige der Schweizer Regierung und des sie repräsentierenden Staatssekretariats, das die Universitäten der Schweiz aufgrund ihrer starken wissenschaftlichen Beziehungen zu *Leading Houses* gegenüber Schwerpunktländern bestimmte. Im Fall der ETH Zürich waren dies zunächst China, Japan und Korea.

Die zunehmende aktive Verknüpfung zwischen diesen Ebenen zeigt eine strategische Verlagerung und eine Erweiterung des traditionellen Begriffs der Internationalisierung. Die ETH blickte mit ihren Partnern in Europa, an der Ost- und der Westküste der USA sowie in Japan und Australien auf eine lange Zusammenarbeit in verwandten Kulturkreisen zurück, die durch gegenseitiges Vertrauen geprägt war, aber nicht zu einem direkten institutionellen ETH-Auslandsengagement in diesen Ländern geführt hatte. Dagegen boten die aufstrebenden Kontinente Asien, Afrika und Südamerika eine neue Herausforderung. Dort war die ETH wenig und eigentlich nur durch die zu dieser Zeit aufkommenden Universitätsrankings bekannt.

Vor diesem Hintergrund entwickelten sich die Pläne für das Auslandsengagement der ETH Zürich. Das wichtigste Ziel und eine nationale Aufgabe der ETH ist die Stärkung der internationalen Reputation des Bildungs-, Forschungs- und Wirtschaftsstandorts Schweiz. Dies betrifft die institutionelle und die individuelle Ebene. Das zweite und zentrale Ziel einer durch individuelle Bottom-up-Initiativen und institutionellem Understatement charakterisierten Institution wie der ETH Zürich bezieht sich auf die Spitzenforschung. Dort erfolgt die internationale Zusammenarbeit primär durch die Forschenden selbst, die ihr Netzwerk mit anderen Bildungs- und Forschungsinstitutionen laufend weiter ausbauen. Inzwischen ist dieses Netzwerk auf mehr als 7.000 Knoten in allen Kontinenten angewachsen. Hier führt die individuelle Ebene, unterstützt durch die institutionelle Ebene. Das dritte Ziel ist die Promotion der erstklassigen Lehre im Ausland, erreicht durch Studierendenaustausch und unterstützt durch die institutionelle und die individuelle Ebene. Das vierte Ziel ist die Schaffung eines strategischen

Mehrwerts durch ausgewählte strategische Allianzen und Partnerschaften mit anderen Universitäten. Damit verbunden ist das fünfte Ziel des institutionellen Lernens, das sowohl durch die individuelle Ebene als auch durch die Allianzen auf institutioneller Ebene erreicht wird. Das institutionelle Lernen dient als Nukleus für Großprojekte wie das Singapore-ETH Centre und für die gemeinsame Bearbeitung von globalen Herausforderungen wie Gesundheit, Energie, Resilienz, *Massive Open Online Courses* oder *Big Data*.

Durch Diskussionen mit den Departementen und innerhalb der Schulleitung der ETH Zürich wurde zunehmend klar, dass sich die ETH zwar ein Forschungs-Engagement im Ausland vorstellen konnte, nicht aber einen Lehrcampus. Die Analyse der Erfahrungen von Partneruniversitäten hatte uns zu der Erkenntnis gebracht, dass wir dauerhaft außerhalb der ETH Zürich mit ihrer im Vergleich kleinen Zahl von Professuren kein Lehrengagement verantworten konnten, falls die Qualität der Lehre auf gleichem Niveau wie an der ETH Zürich sein sollte. Dies aber ist eine Voraussetzung für eine gute Reputation. Daher kam lediglich ein Forschungsinstitut im Ausland infrage. Die Bedingungen dafür sind die folgenden: Das Projekt muss von den Professuren vorgeschlagen und getragen werden, was das Vorhandensein von Peer-Institutionen vor Ort voraussetzt. Die Departementsvorstände müssen das Projekt in Hinblick auf die Balance von Lehre und Forschung unterstützen. Das Institut muss lokal Forschungsfragen beantworten können, die globale Bedeutung haben und die in dieser Form nicht an der ETH Zürich beantwortet werden können, sondern hauptsächlich im lokalen Kontext. Schließlich muss das Institut vor Ort kreative Freiheiten nutzen und neue administrative Formen entwickeln können, die damit auch Rückwirkungen auf die ETH haben können und eine neue Form des institutionellen Lernens darstellen.



Interaktives Tool für die Simulation der Energiezukunft in Äthiopien, von Eva-Maria Friedrich; Foto: Prof. Gerhard Schmitt

Die Überlagerung der Ziele und Voraussetzungen rückte Singapur zunehmend in den Mittelpunkt. Dort war bereits eine starke Vernetzung zwischen den Professorinnen und Professoren der National University of Singapore und der ETH Zürich gegeben, wie mehrere Dutzend gemeinsame Veröffentlichungen und reger Studierendenaustausch pro Jahr zeigten. Es fanden auch gemeinsame virtuelle Entwurfsstudios zwischen den Architekturabteilungen der Institutionen statt. Als erstes Programm konkretisierte sich das Future Cities Laboratory, unterstützt von den betreffenden Departementen. Es hat zum Ziel, die brennende Frage der Urbanisierung in den Ländern direkt nördlich und südlich des Äquators zu verstehen, auf eine wissenschaftliche Basis zu stellen und mit konkreten

Entwürfen zu beantworten. Diese Arbeit kann nur im tropischen Kontext geschehen, da dort das schnellste Wachstum der Städte weltweit stattfindet, und da alle vorherigen Versuche, Städteplanung aus anderen Breitengraden sinnvoll in die Tropen zu übertragen, gescheitert waren. Schließlich schuf Singapur mit dem CREATE Campus die einmalige Möglichkeit, Spitzeninstitutionen wie das Massachusetts Institute of Technology, UC Berkeley, University of Cambridge und die ETH an einem Ort zusammenzubringen, und im selben Gebäude zwischen Forschungsgruppen der einzelnen Universitäten Themen gemeinsam zu bearbeiten.

Dies führte dazu, dass ab 2007 konkrete Verhandlungen zwischen der National Research Foundation von Singapur und der ETH Zürich stattfanden, die nach drei Jahren zur Unterzeichnung eines Abkommens führten. Im September 2010 nahm das Singapore-ETH Center seine Arbeit auf und startete das Future Cities Laboratory als erstes Programm. Das Institut begann mit zwei Personen, und involvierte innerhalb der ersten drei Jahre mehr als 200 Personen. Eine

Zwischenevaluation im Herbst 2013 war erfolgreich, so dass ein zweites Programm und eine zweite Phase des Future Cities Laboratory in Aussicht gestellt werden konnten. Mehr als 40 Doktorierende, 80 Master-Studierende, 30 PostDocs und 20 Professorinnen und Professoren haben inzwischen im Future Cities Laboratory gearbeitet und wesentliche Beiträge zu einem neuen Verständnis der Stadt und der Stadtplanung in tropischen Gebieten geliefert. Die Internetseite des Future Cities Laboratory liegt seit 2012 an der Spitze der Web-suchen und hat damit für die ETH Zürich sowie die beteiligten Universitäten und Städte in Asien und um den Äquator eine Win-win-Situation geschaffen. Der erste *Future Cities Massive Open Online Course* geht im Herbst 2014 mit EdX online.



Weitere Informationen

ETH Zürich

→ <https://www.ethz.ch/de.html>

Future Cities Laboratory

→ <http://www.futurecities.ethz.ch>

Institutional Strategies of CIRAD to Establish a Research Presence in the Asia-Pacific Region

CIRAD (Centre de coopération internationale en recherche agronomique pour le développement) is a French research centre working with developing countries to tackle international agricultural and development issues. Its status is a public industrial and commercial enterprise under the joint authority of the Ministry of Higher Education and Research and the Ministry of Foreign Affairs. CIRAD's activities involve the life sciences, social sciences and engineering sciences, applied to agriculture, food and rural territories. CIRAD has a staff of 1,800, including 800 researchers and has twelve regional offices in metropolitan France, the French overseas regions and other countries, from which it conducts joint operations with more than 90 countries.

ITB: What was/is your motivation for setting up and experience with running an international research presence?

Dr. Philippe Girard: The Asia-Pacific region is home to 57 % of the world population and 73 % of global agricultural population on only one third of agricultural land. However, it produces 90 % of the world rice production, 40 % of cereal, 40 % of meat, 70 % of the global market for vegetables and 80 % of the aquaculture.



Despite these results, 63 % of the world population living below the poverty line and suffering from malnutrition is still in the area. Challenges to the agricultural sector are thus immense and urgent responses must be made.

CIRAD is convinced that an international research presence in Asia-Pacific, which is open to the outside and respects people, territories and the environment, is mandatory to address the major development issues. There can be

indeed no sustainable development of a society without the development of its scientific culture and its capacity to generate scientific knowledge.

As partnership is a founding principle of CIRAD's approach, our organization has chosen not to create its own establishment in Asia-Pacific, but to conceive and develop platforms for research and higher capacities education to address pertinent themes, whether they be local, regional or global. Our mission is to conduct good science in partnership whose results will be an aid to the development of the poorest region. In Asia-Pacific, CIRAD has chosen to focus its scientific strategy on four axes of research:

- Foreseeing and managing infectious disease risks linked to wildlife and domestic animals;
- Supporting public policies aimed at reducing structural inequality and poverty;
- Climate change and pressure on natural resources;
- Conservation and sustainable management of biodiversity.

ITB: What are the legal and administrative framework conditions?

Dr. Philippe Girard: Our legal and administrative framework conditions match our principle of "working together". Our forty expatriate staff in Asia and the Pacific is systemically hosted in the premise of the national partner institutions in order to jointly identify the development challenges and translate these challenges into collaborative research priorities. Some of our scientists are also hosted in regional centers (AIT, SEARCA) or agricultural research centers in the Consultative Group on International Agricultural Research (CIFOR, World Fish Center).

The presence of CIRAD in all the ASEAN countries is formalized through a framework agreement with a ministry (usually agriculture or forest) followed by the signature of several specific agreements with local research institutes or universities, either to host our staff or as part of the implementation of specific projects of research. Institutionally, CIRAD has opened two offices of Regional Directorate located in Hanoi in 1999, and Jakarta in 1992. Since January 2006, the Vietnamese government has conferred to the office in Hanoi a status of "representative office of foreign based research". In Indonesia, CIRAD received in

1992 a license granted by Indonesia's Investment Coordinating Board to open an office having a private status, making it possible to conduct consultancies for the private sector. In the two countries, CIRAD is now pooling its office with IRD and CNRS, two other major French research institutions.

ITB: What resources are used?

Dr. Philippe Girard: Strengthened by a broad experience of 40 years in the tropical and sub-tropical countries of Southeast Asia, CIRAD and its partners have developed an innovative tool to tackle international agricultural research and foster scientific partnership through the "Platforms in Partnership for Research and Training". These platforms, which are concretely a group of 5-15 European and Asian partners having the desire to work together, make it possible to gather a critical mass of multidisciplinary competences and activities on a defined geographical area and a shared research strategy.

A resource for hosting researchers and encouraging mobility, these platforms are a good tool for boosting the independence of the scientific communities concerned within the global agriculture research system and creating a dynamic portfolio of research projects. They are consequently generating diversified expertise, based on wealth of experience and are a means of producing local scientific knowledge and boosting innovation.

The management system is based on the long-term commitment to share human, material and financial resources to achieve the shared outlooks and objectives. The platforms are collectively managed by all partners through three levels of governing bodies. Revolving chairs are implemented according to rules established in the different agreements. External evaluations are performed every four years, providing the opportunity to update or define a strategic road map.

In Asia and Pacific, CIRAD and its partners have now developed four regional platforms entitled:

- Conservation Agriculture Network for South East Asia (CANSEA), involving seven partners in the Greater Mekong countries and Indonesia;
- Management of Emerging Epidemiological Risks in Southeast Asia (GREASE), involving ten partners in Europe, Greater Mekong countries,

Southern China and Asian island countries, together with institutions like OIE, FAO;

- Hevea Research Platform in Partnership (HRPP), involving fifteen partners in Thailand, continental Southeast Asia and France;
- Markets and Agriculture Linkages for Cities in Asia (MALICA), involving four partners in Vietnam and Laos.

ITB: What is the long-term perspective?

Dr. Philippe Girard: CIRAD and its partners want to make these platforms a major player in talks between Europe and the South and a point of contact for political decision makers and funding bodies. A challenging perspective is notably to facilitate access for its partners in Asia to EU programs and to the excellence of European research.

Beside, CIRAD has the ambition of ensuring these platforms play an active role in coordinating and networking international scientific communities, notably by connecting Asian stakes with other different tropical and sub-tropical areas in Africa or Latin America.

ITB: As you are working in different countries, what are the specific challenges among partner countries?

Dr. Philippe Girard: In low-income Asian countries, which have seen structural adjustment, national research centres have often seen their resources shrink. While advocating the quest for excellence and global usefulness of outputs, CIRAD feels that priority should be given to building scientific production capacity. In these least advanced countries, CIRAD is therefore strengthening the research capacity and conducting applied research in partnership.

At the same time, emerging countries like Thailand, Malaysia and now Indonesia have been investing massively in agricultural research and building scientific capacity equivalent to that of the most advanced research organizations in Europe. This scientific excellence allows some Asian teams to join the best international consortiums engaged in international agricultural research and fuel the debate on the main global issues concerning agriculture that largely overpass the Asian context.

Die Fragen an Dr. Philippe Girard stellte

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Weitere Informationen

Centre de coopération internationale en recherche agronomique pour le développement (CIRAD)

→ <http://www.cirad.fr/en/home-page>

Asian Institute of Technology (AIT)

→ <http://www.ait.ac.th/>

Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA)

→ <http://www.searca.org/>

Center for International Forestry Research (CIFOR)

→ <http://www.cifor.org/>

World Fish Center

→ <http://www.worldfishcenter.org/>

Centre National de la Recherche Scientifique (CNRS)

→ <http://www.cnrs.fr/index.php>

Institut de recherche pour le développement (IRD)

→ <http://en.ird.fr/>

Conservation Agriculture Network for South East Asia (CANSEA)

→ <http://www.cansea.org.vn>

Management of Emerging Epidemiological Risks in Southeast Asia (GREASE)

→ <http://www.grease-network.org>

Hevea Research Platform in Partnership (HRPP)

→ <http://www.hrpp.ku.ac.th>

Markets and Agriculture Linkages for Cities in Asia (MALICA)

→ <http://www.malica-asia.com>

World Organisation for Animal Health (OIE)

→ <http://www.oie.int/>

Food and Agriculture Organization of the United Nations (FAO)

→ <http://www.fao.org/>

Establishing a European-Chinese Joint Research Institute: the Example of Institut Pasteur Shanghai and the Pasteur Network in Asia-Pacific

The international network of Institut Pasteur (IP) counts 32 institutes in five continents. The network is almost as old as the Paris institute itself. Institut Pasteur was founded in 1888 in Paris, just three years after the experimental rabies vaccine developed by Louis Pasteur was successfully administered for the first time to a nine year old boy who had been bitten by a rabid dog. The boy survived and the success generated by the rabies vaccination triggered not only the start of an outstanding research institute but also its international development. The first overseas Institut Pasteur was established in 1891 in Ho Chi Minh City (formerly Saigon) and given the mission to carry out vaccinations in Indochina. As of today, nine Pasteur institutes have been created in the Asia-Pacific region.

Institutes in the network are linked by common public health-focused objectives, a high level framework agreement and adherence to the same ethics charter. They contribute to and benefit from joint project funding schemes and scholarships to promote mobility within the network. Joint Pasteur network programs typically focus on infectious diseases that are of importance in the region. The Pasteur network however is not a corporate structure managed from the Paris institute, but rather an association of legally independent institutes with common objectives. As such, governance structures vary greatly between institutes. While some are entirely funded and managed by the host country, e.g. Hanoi, others like Cambodia are more dependent on funding from France resulting in a stronger governance position by the French Institut Pasteur. Others, like Shanghai and South Korea have



Institutes in the Asia-Pacific region that belong to the International network of Pasteur institutes

a mixed governance system where board of directors and management are appointed both from the French and from the host country side.

In China, the Institut Pasteur of Shanghai, Chinese Academy of Sciences (IPS-CAS) was founded in 2004 by the Institut Pasteur in France, the Chinese Academy of Sciences (CAS) and the Shanghai Municipal government. The creation and the development of IPS-CAS was strongly supported by the French and Chinese governments as a strategic project between both countries.

Institutional objectives to create an Asian subsidiary

The objectives to create Pasteur institutes have been very different depending on the institute. Providing public health functions, such as reference labs for infectious diseases or manufacturing and dispensing vaccinations are conducted in countries that do not have independent capabilities. For institutes like IPS-CAS and IP Korea the objectives were completely different: The focus was on creating international centers of excellence in infectious disease research, high level scientific productivity and developing cutting edge technologies. In the wake of the SARS outbreak in 2003, which spread across the globe from Asia within days, the Chinese government and CAS stepped up efforts to improve infectious disease research and surveillance. Institut Pasteur, with a long history of infectious disease research, was an ideal partner and IPS-CAS was created with the strategic objective to jointly investigate and develop solutions for infectious diseases. Today IPS has 24 teams and 320 staff and students with two teams managed by foreign scientists.

Experience with running an international research presence

In the Pasteur network there is a vast experience in managing joint research institutes according to different partnership agreements. At IPS, the three founders are represented at the board of directors which is chaired by the Vice-President of the Chinese Academy of Science, Prof. Zhang Yaping. Management at IPS follows a co-director scheme, with the Director General appointed by Institut Pasteur and the Co-Director appointed by the CAS, both working closely as a team. All third party agreements of IPS-CAS must be signed by both directors in order to become effective. Management and board of directors work as a team focused on common objectives.

The management's principal role is to provide strategic guidance and to procure sufficient human, financial, administrative and technological resources for the research teams. IPS' performance and strategy is evaluated regularly by the board of directors and external scientific advisors. The administration and financial management are also reviewed and audited regularly.

Legal and administrative framework conditions

When joint institutes are started common sense and good will prevails, but to be successful any foreign Chinese joint institute needs to prove itself in the long run, long after the ribbon cutting events. Beyond the jointly agreed research objectives, it is important to establish well thought-through agreements at the start determining governance and administrative procedures such as human resources, financial and legal/IP management. At IPS-CAS, we have found the Chinese partner, CAS, very respectful of the commitments they signed up for in 2004, which included providing a building capable of hosting over 300 staff and providing the bulk of the funding for IPS-CAS.

Long term strategy, good implementation, detailed internal regulations and human and financial resource planning are key to a harmonious operation and to maintain a balanced relationship between the founding parties.

What resources are needed?

A successful partner institute in China today requires three types of resources: human, financial and unique scientific or technological expertise from Chinese and foreign parties.

(1) There needs to be a significant human presence of senior and junior scientists from the overseas country in the China based joint institute. Enough talents need to be identified who are willing to relocate for several years to China.

(2) Financial contributions from both parties are essential, as they materialize the commitment to the joint project. A joint institute in China can be expected to be majority-funded by the Chinese side for infrastructure, technology platforms and salaries for Chinese employees. The overseas partner needs to focus on the support for the scientists that are relocating to China, i.e. salaries and housing expenses and start-up grant funding for the newly developed research programs. Such a start-up research funding for the overseas scientists is important



In 2013 IPS moved into its new building which is located on the campus of the Shanghai Institutes of Biological Sciences (CAS); picture: IPS-CAS

because it will take time for the foreign scientists to settle into the Chinese system and obtain their own competitive Chinese government grants. A well planned institute should also provide the foreign scientists with career perspectives in China or return options. Providing such options largely increases the possibility to attract foreign scientists to come to China in the first place. Establishing dedicated, recurrent and competitive grant schemes, post-doc scholarships and joint PhD programs from the start is the ideal situation.

As a benchmark, the all-inclusive cost (except building and rent) of doing biology research in China is about 250,000-300,000 euros per team per year and approximately 12 million euros per year for an institute of 350 staff and students. Around 30 % funding of overseas funding should be achieved to make the operation meaningful and to guarantee that the foreign entity has a strong position in the joint foreign Chinese organization and to justify sharing the intellectual property.

(3) Human resources for administrative, legal and financial management should also be provided by both parties to act quickly on contracts and implement the joint institute's regulations. The foreign scientists will work most efficiently in China if they are supported by an efficient joint administration.

What is the long-term perspective?

The perspective for IPS-CAS is to be a long-term Sino-French partnership in the field of life sciences, as a platform for Asia-Pacific programs in the field of infectious diseases and exchange of junior and senior scientists between both countries. IPS-CAS also positions itself as a collaboration hub for other French and European research organizations that do not wish to develop their own structure.

For new foreign Chinese structures, one should take into account China's ambition to become a knowledge-based economy and to translate scientific discoveries into benefits for society and innovations with economic potential, particularly in the biomedical sector.

Specific challenges of working in China

There are many challenges of working in China, but based on our experience there are none that cannot be dealt with.

(1) Mechanisms to obtain competitive research funding are similar to elsewhere but need to be submitted in Chinese which requires administrative support. Although most of them are open to anyone working in China some grants are still reserved for Chinese nationals. We have experienced that officials pay attention to this point and there is hope that this might change.

(2) For research on primary biological samples it is important to understand that it is virtually impossible to export primary biological samples out of China, but there is no restriction to work on such samples as a foreigner in China, for example, in collaboration with Chinese hospitals or the Chinese Center For Disease Control And Prevention.

(3) Networking and personal relationships are particularly important in China. It is important for a foreign scientist to make his/her projects known at national level to compete well for government grant funding. While challenging at first it is possible without problem to establish yourself in the Chinese scientific system although this takes longer for a non-Chinese foreigner than for a Chinese returnee scientist from the US or EU.

(4) It is obviously helpful to learn the language to integrate, but it is not essential to do science in China. At IPS, all team leaders are overseas trained and speak English.

(5) Financial management follows regulations and guidelines from the central and municipal government and in our case CAS regulations. There are pre-defined ceilings on the allocation of government grants to salaries that are different from what we know in the EU. Regulations change and improve regularly and a China based joint institute needs to stay abreast with the changes.

(6) A joint institute in China operates under laws of the PR China. We have come up close and personal with laws governing clinical research and ethics or patent law. Not only was it relatively straightforward to understand them, we also came to the conclusion that they provide a very good framework within which to

operate. As for patent filing, there is a requirement to file a patent first in China in Chinese language unless an exempt is granted by the government. As a foreigner I have filed two patents from my work in China, one of which is in PCT, without any procedural obstacle to report. In contrast to a common thinking that foreign intellectual property is at risk of being infringed in China, we have never made such an experience at IPS.

(7) If foreigners are recruited on a local scheme and paid by Chinese government sources they need to fit into the same salary grid. As a consequence, if no foreign funding is available, many foreigners do not come to China because they do not want to work on a lower salary or because they cannot afford the expensive international schools.

In conclusion, the scientific environment in China is changing and developing fast and today China knows how to produce world class science thanks to the allocation of massive human and financial resources in the recent past. The opportunity today lies in the increasing internationalization of Chinese science and the desire to establish large scale collaborations that are scientifically world-class, innovative with a focus on societal and economic benefit. Even for major research organizations in the west it is challenging to keep up with the pace, human and financial resources, and speed of implementation in China. To be most effective, it appears that efforts at government, institutional and researcher level ought to be combined when setting up a new joint research organization in China.

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Weitere Informationen

Institut Pasteur

→ <http://www.pasteur.fr/ip/easysite/pasteur/en>

Institut Pasteur of Shanghai

→ <http://english.shanghaipasteur.cas.cn/>

→ <http://www.pasteur-international.org/ip/easysite/pasteur-international-en/institut-pasteur-international-network/the-network/institut-pasteur-in-shanghai>

Sino-Danish Center for Education and Research (SDC)

In the spring of 2010, all eight Danish universities jointly signed an agreement with the University of the Chinese Academy of Sciences (UCAS) in Beijing to establish the Sino-Danish Center for Education and Research (SDC). It marked the beginning of one of the most ambitious Danish long-term investments in education and research outside of Denmark ever.



Danish Prime Minister Helle Thorning;
photo: Sino-Danish Center for Education and Research

The idea of establishing a Danish university center in China was born back in 2007 when the Danish Minister for Science, Innovation and Higher Education visited China together with representatives from Danish universities, Danish research foundations, and Danish companies operating in China. The Minister's visit subsequently triggered a debate about how Denmark as a small country could position itself better as an attractive partner

vis-à-vis the strong Chinese research environment. One of the outcomes of this debate came in the form of a ministerial publication, *Strategy for Collaboration with China on Research and Education*, outlining a number of possible initiatives to strengthen Sino-Danish collaboration. Among the suggestions was the establishment of a Danish university center in China. In early 2008, a task-force was formed to identify a possible partner in China and from here things started moving fast. The University of the Chinese Academy of Sciences showed great interest in the prospect for a collaboration and soon a Memorandum of Understanding was signed in Beijing under the witness of Chinese Premier Wen Jiabao and Danish Prime Minister Anders Fogh Rasmussen. In April 2010, the collaboration between all eight Danish universities and UCAS on the Sino-Danish Center for Education and Research was formally sealed through the signing of a Partnership Agreement in the Great Hall of the People in Beijing.

The aim and visions for SDC

SDC was established with the overall aim of promoting and strengthening collaboration between Danish and Chinese research and learning environments either by supporting already existing ties between Danish and Chinese research environments or by providing a platform that helps facilitating new collaborations within a number of selected academic fields where both countries have strong track records.

The Danish and Chinese sides share the costs of operating the SDC although the majority of both sides' contribution comes in the form of in-kind contributions. The Danish side covers all expenses related to Danish teachers' and researchers' stays in China while the Chinese side provides free access for Danish teachers and students to research laboratories and teaching facilities. A small joint budget is available for the Danish and Chinese director to cover expenses for workshops, symposia, teaching activities, etc.

Joint research as the solid foundation for collaboration

For a start, the collaborating partners have decided that SDC should mainly focus on five academic fields: Life Sciences, Social Sciences, Water & Environment, Sustainable Energy, and Nanoscience. Other fields may be added in the future if the partners agree but the main focus now is to further develop joint research activities within these five fields. Not only because we need to better support SDC's educational activities (see below) in the short-term but more importantly because it is a precondition for SDC to develop successfully in the long-term that researchers share research interests and see a true benefit in collaborating on research projects. Strong scientific collaboration must be the foundation for all the educational activities.

SDC Master's programmes

Within each of the above-mentioned five academic fields, the SDC in Beijing offers one or two Master's programmes to Danish and Chinese students. The two-year Master's programmes have been jointly developed by both sides and are unique in the sense that they cannot be found similarly in Denmark nor China. All programmes are taught in English by Danish and Chinese teachers.

Four Master's programmes were launched in September 2012 (Water & Environment, Neuroscience & Neuroimaging, Innovation Management, and Public Management & Social Development) while another three were added in September 2013 (Nanoscience & Technology, Chemical & Biochemical Engineering, and Omics). In 2012, 104 students were enrolled (48 from Denmark, 56 from China) with the number increasing to 146 students in 2013 (48 from Denmark, 98 from China).

Although the main criteria for success is to train students in the best possible way and make them highly attractive candidates for Danish and Chinese private companies and organizations, we have already succeeded by simply increasing the number of Danish students studying in China. During the time they spend in China, the Danish students not only form networks with their Chinese students and supervisors, networks that may become valuable in the future, but also learn about China the hard way through the everyday lives they live in Beijing. In a time where China is on everybody's lips it is essential to have young scholars with high academic skills and lots of cultural capital.

What probably distinguishes SDC the most from other models of collaboration between Western universities and China is the fact that all of SDC's educational activities will soon take place in a separate building, *The House of the Danish Industry Foundation*, to be constructed on UCAS' campus north of Beijing. Money for the construction has been donated by the Danish Industry Foundation while famous Danish architects Lundgaard & Tranberg have designed the building that reflects Nordic architectural traditions with strong focus on high quality building standards and low energy consumption. Thus, the building will not only serve as strong visual symbol of the academic activities of the SDC but also be a display window for Danish technologies in China.

A good first step

The SDC is only a few years old and the full potential of the collaboration is yet to be seen. Joint Sino-Danish research projects are still being slowly established within the SDC framework and the first batch of Master's students has not even graduated yet. It will probably take many years of hard work before we can begin to see the real return of the big investments made in the SDC. But what we can

already see is that we have succeeded in finding a model for collaboration between Denmark and China that enjoys strong support from both countries' governments and this is certainly a good starting point. We may not have the perfect model yet, adjustments will have to be made in the future, but as famous Chinese philosopher Laozi is often quoted: A journey of a thousand miles begins with a single step!



Download

Strategy for Knowledge-Based Collaboration Between Denmark and China

→ <http://www.sinodanishcenter.com/media/34163/Strategy%20for%20Knowledge-based%20Collaboration%20between%20Denmark%20and%20China.pdf>

Weitere Informationen

Sino-Danish Center for Education and Research (SDC)

→ <http://www.sinodanishcenter.com>

University of the Chinese Academy of Sciences (UCAS)

→ <http://english.ucas.ac.cn/Pages/default.aspx>

imec Taiwan: Bridging the Gap – Bridge to the World

The establishment of imec Taiwan Co. in 2008 was the result of imec's long standing relation with Taiwan. Already in the early nineties academic collaboration agreements were inked between imec and the Taiwanese National Science Council and several major universities and research institutes. This resulted in numerous successful international research projects in areas like wireless communication and ultra-low power integrated circuit design. As a consequence there was a significant exchange of researchers and a whole range of joint dissemination activities. The intensive interaction with the Taiwanese ecosystem eventually justified the set-up of a permanent office in Taiwan.

What originally started in the early days as pure academic collaborations grew into the establishment of the imec Taiwan Innovative Research and Development (R&D) Center (ITIC) in Hsinchu with a major focus on applied research and technology transfer.

Setting up such an R&D center in Taiwan perfectly fitted with imec's internationalization strategy. The strategic objective for imec was to continue and increase the value, offering for imec's existing R&D partners in Taiwan and at the same time help more Taiwanese companies to innovate, grow their business and collaborate internationally. In a changing world there is a continuous need to adapt existing business models and R&D interactions. Since the founding of imec in Belgium, now exactly 30 years ago, imec has always been at forefront in promoting the so called Open Innovation Model. imec's renowned Industrial Affiliation Programs (IIAPs) allow its partners to develop solutions for generic semiconductor technology issues, while sharing risk, cost and intellectual property (IP). This Affiliation Program model works very well for semiconductor technology players working together in a pre-competitive mode and with a time horizon of three to five years until product commercialization. However, when looking at system level and product companies, a different approach is required. Most of these system integrator and product companies are operating their R&D teams at a level closer to the market, let's say six months to a year, and in a very competitive mode with their peers. They require mature intellectual property, not just



Bluetooth wireless electrocardiogram patch and posture monitoring device with imec's ultra low power SOC; photo: imec

research proof-of-concepts, and complete systems solutions. This helps them to bring novel technology into products and into the market quickly. ITIC's mission is to bridge the gap between exploratory research and the need for mature IP and specific applications. ITIC has a major focus on applied research in areas like wearable healthcare, flexible electronics and imaging technology. It realizes that mission by

bringing existing imec technology to a higher technology readiness level, and by providing local companies with solutions for system integration bottlenecks and productisation issues. ITIC performs feasibility studies and provides technology demonstrators to its industrial partners in Taiwan. To local universities it provides open technology platforms that can be used for training or scientific research.

Why Taiwan matters

Just like Belgium, the Taiwanese industry is characterized by a fairly large number of small to medium sized companies, which are often top players in their respective markets. The close proximity to the R&D teams of imec's partners provides definitely a competitive edge in terms of time-to-market. This industry landscape is quite different from some other countries in the Asia-Pacific region, where that industry is often dominated by only a few very large industrial conglomerates. ITIC helps the Taiwanese industry to get access to leading-edge technology, it provides total solutions, including software apps and prototypes. The ultimate goal is to bring academic research to product commercialization. The presence of a mature semiconductor industry in Taiwan, the excellent infrastructure found in its Science Parks, top-notch academic institutes and an open entrepreneurial environment made that a good match was easily found. Above all, the legal framework that is available in Taiwan to protect intellectual property is at a similar level as western standards and provides a safe

haven for conducting research and development. Various Taiwanese government agencies have shown over the years to be very instrumental and supportive to the establishment, growth and maturation of the ITIC.

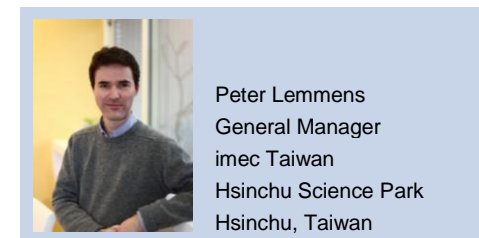
A win-win relation

imec collaborates globally with over 600 companies. Leveraging these international R&D partnerships and connecting Taiwanese companies and research institutes to the world, creates enormous opportunities for all partners involved. This provides a better understanding of application needs, support in setting international standards and eventually provides insights in trends and product designs that end-customers want. An international reach is a very important aspect for a country that is predominantly export driven. Taiwan is located at the center of the global electronics manufacturing industry. Especially in the information and communication technologies industry, Taiwan has still a dominant impact on future technology developments and implementations. Being able to capture those fast evolving dynamics locally and transfer the information back home to Europe provides valuable insights for imec, which among others can serve as input for defining its research roadmaps. A very elaborate ecosystem is present in Taiwan in areas like electronics manufacturing, precision mechanics, and opto-electronics. Getting access to that ecosystem provides an efficient methodology for imec to research and develop industry relevant solutions with a realistic path to industrialization.

Outlook

imec in Taiwan continues to work closely with the top universities and research institutes. One of the key elements in these collaborations, besides joint research projects, are the trainings provided by invited foreign experts. This helps to cultivate local talent and is highly appreciated. Furthermore, quite some Taiwanese PhD students have signed up for the dual-degree university program and perform part of their research at imec in Europe. The aim to pursue the joint research collaborations with Taiwanese universities also from within the local office is to bring to a large pool of researchers, in an efficient and cost effective way, insights into industry relevant challenges, provide methodologies, training, and application domain knowledge. The acceptance by the European Commis-

sion for Taiwan to join Horizon 2020 research projects opens up a whole range of future research collaboration opportunities that can be beneficial for all consortium partners. In a knowledge-based economy, the future of the industrial and service sectors will increasingly depend on its ability to innovate. To achieve such an innovation process, a close collaboration between universities, research institutes, industry and the government authorities is most important. The numerous success cases of international joint R&D collaborations clearly indicate the benefit of the international research institute initiative. Demonstrating passion and the patience to gradually grow to what has become an intensive relation is a strategic choice of importance when making multi-cultural collaboration investments a success.



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Weitere Informationen

imec Headquarter

→ http://www2.imec.be/be_en/home.html

imec Taiwan

→ http://www.imec-tw.tw/tw_en/taiwan.html

Industrial Affiliation Programs (IIAPs)

→ http://www.imec-nl.nl/nl_en/collaboration/joint-r-and-d.html

Ausführliches Clusterporträt Hsinchu bei Kooperation international

→ <http://www.kooperation-international.de/clusterportal/cluster-hsinchu.html>

Strategische Überlegungen aufnehmender Länder und Organisationen

Cluster – Kristallisationspunkte ausländischer Forschungspräsenzen

Clusterpolitische Ansätze sind ein zentraler Bestandteil moderner Forschungs-, Technologie- und Innovationspolitik. In Clustern sind Unternehmen innovativer und wirtschaftlich erfolgreicher – und dies aus verschiedenen Gründen: Die Nähe von Unternehmen, Hochschulen und Forschungseinrichtungen sowie der Austausch von Talenten und Wissen tragen zu mehr Ideen, zu höherer Innovationkraft und zu erfolgreichen Innovationen bei.

Dies führt nicht nur dazu, dass Unternehmen im Cluster wirtschaftlich erfolgreicher sind und wachsen, sondern auch neue Unternehmen entstehen oder sich ansiedeln, Investoren sich im Cluster engagieren und die intelligentesten Köpfe von den Möglichkeiten des Clusters angezogen werden. Cluster wirken also wie ein Magnet auf Menschen, Unternehmen und Kapital – und dies nicht nur innerhalb der eigenen Landesgrenzen, sondern international. Ein Ergebnis ist, dass sich Forschung und Entwicklung international auf wenige Standorte konzentriert. Diese stehen miteinander im Wettbewerb und sind zugleich über zahlreiche Beziehungen entlang internationaler Wertschöpfungsketten miteinander verflochten.

Oftmals angetrieben von ambitionierten Programmen zur Entwicklung internationaler Hightech-Standorte gewinnt derzeit insbesondere der asiatisch-pazifische Raum neben den USA und Europa im internationalen Standortwettbewerb an Bedeutung. Ein Beispiel ist der im Nordwesten Pekings gelegene Zhongguancun Science Park: In diesem rasch wachsenden Wissenschaftspark haben sich 20.000 Hightech-Unternehmen mit 360.000 Beschäftigten angesiedelt, darunter 60.000 Beschäftigte im Bereich Forschung und Technologie. Eine große Herausforderung besteht darin, den Bedarf an Fachkräften, Wissenschaftlern und Unternehmen zu decken. Hierfür wurden weltweite Rückkehrer-Programme gestartet oder internationale Kooperationsprogramme aufgelegt und gezielt um Wissenschaftler aus dem Ausland geworben.

Internationalisierungsstrategien bilden vor diesem Hintergrund einen wichtigen Bestandteil von Clusterentwicklungsprogrammen. Die Instrumente hierfür sind vielfältig. Vor einigen Jahren wurden in einer international vergleichenden Studie (Entwicklung von Kompetenzclustern und -netzen zu internationalen Kompetenzknoten, VDI Technologiezentrum GmbH, Düsseldorf 2008) Hightech-Cluster weltweit danach befragt, welche Internationalisierungsinstrumente im Mittelpunkt ihrer Arbeit stehen. Die Gewinnung internationaler Forschungszentren, umfassende Investitionsbeihilfen sowie die Etablierung von Auslandsrepräsentanzen als „Brückenköpfe“, um Talente, Kapital und Unternehmen anzuziehen, kristallisierten sich dabei als die wichtigsten Instrumente von Clustern in der Region heraus.

Einige der in der vorliegenden Ausgabe des *ITB infoservice* beschriebenen Beispiele ausländischer Forschungspräsenzen in Asien bestätigen dieses Bild. Zugleich zeigen sie, dass neben Forschungs- und Entwicklungszentren internationaler Unternehmen verstärkt auch Hochschulen und Forschungseinrichtungen mit eigenen Repräsentanzen in der Region vertreten sind. Die Motive, zwischen denen eine Reihe von Wechselwirkungen bestehen, lassen sich dabei folgendermaßen zusammenfassen.

Cluster Zhongguancun

Im Nordwesten Pekings befindet sich der Zhongguancun Science Park (ZSP), der größte aller Hightech-Parks in China. Fachthematische Schwerpunkte liegen auf der Elektronik sowie den Informations- und Kommunikationstechnologien (IKT). Daneben spielen die Bereiche moderne Fertigungstechniken, erneuerbare Energien, Biotechnologie und neue Werkstoffe eine herausgehobene Rolle. Im Park existieren über 20.000 Hightech-Unternehmen, von denen knapp 190 börsennotiert sind. Mit einer Gesamtfläche von 488 km² erstreckt sich der ZSP über 16 Bezirke und Stadtteile Pekings. Rund 50 der 500 führenden multinationalen Unternehmen weltweit haben mittlerweile Zweigstellen oder Forschungseinrichtungen vor Ort errichtet.

Seit der Gründung spielen Universitäten und Forschungseinrichtungen in unmittelbarer Nähe des ZSP eine bedeutende Rolle. Zu den wichtigsten Institutionen zählen die Tsinghua Universität, die Universität Peking und die Chinesische Akademie der Wissenschaften (CAS).

Der ZSP war der erste nationale Wissenschafts- und Technologiepark in China und hatte das Ziel, das Wissenskapital der Region für Innovation nutzbar zu machen. Am 13. März 2009 genehmigte der chinesische Staatsrat den Ausbau des ZSP in eine „Nationale Demonstrationszone“ (*Zhongguancun National Demonstration Zone*).

Eine wesentliche Zielsetzung ist es, in der Liga der weltweit führenden Forschungsstandorte und -institutionen mitzuspielen. Diese Zielsetzung findet sich sowohl in den entsendenden als auch in den empfangenden Ländern. Ein Beispiel ist Singapur. Die beiden staatlichen Institutionen für höhere Bildung, die National University of Singapore (NUS) und die Nanyang Technological University (NTU) erreichen Top-Platzierungen in den globalen Universitätsrankings. Zugleich wurde mit CREATE eine Infrastruktur für die Zusammenarbeit mit weltweit führenden Hochschuleinrichtungen geschaffen (vgl. S. 26). So beschreibt die ETH Zürich den CREATE Campus als „einmalige Möglichkeit, Spitzeninstitutionen wie das Massachusetts Institute of Technology, UC Berkeley, University of Cambridge und die ETH an einem Ort zusammenzubringen“ (vgl. S. 10).

Ergänzt wird dieses Motiv durch die Möglichkeit, Forschung und Entwicklung in räumlicher Nähe zu globalen Herausforderungen zu betreiben. Seien es die spezifischen Herausforderungen der Urbanisierung in den Tropen, die Infektionsforschung oder die Entwicklung leistungsfähiger öffentlicher Gesundheitssysteme – Lösungen lassen sich oftmals besser direkt vor Ort als unter Laborbedingungen in Europa finden. Diese Zielsetzung, die oftmals in entwicklungspolitischen Zielen ihren Ausgang nahm, steht immer häufiger im Kontext internationaler Spitzenforschung. Dies belegt etwa das Beispiel der französischen CIRAD, deren Partnerländer zunehmend internationale Spitzenforschung betreiben, welche weit über den asiatisch-pazifischen Raum hinaus wirkt (vgl. S. 11).

Die räumliche Nähe zu den Anwendern steht auch bei einem weiteren Motiv im Mittelpunkt: der Umsetzung von Forschungs- und Entwicklungsergebnissen in marktfähige Produkte. Die Beispiele von imec Taiwan (vgl. S. 19) oder der VTT Korea (vgl. S. 30) belegen dies eindrucksvoll. In beiden Fällen startete die Zusammenarbeit als FuE-Kooperation an den Standorten im jeweils entsendenden Land (Belgien bzw. Finnland). Die Motivation hierfür war der Bedarf der an den Kooperationen beteiligten Unternehmen aus dem asiatisch-pazifischen Raum an stärker anwendungsorientierter Forschung bis hin zu Prototypen, Demonstratoren und marktfähigen Produkten. Dies ließ sich am ehesten in den gut entwickelten Clusterstrukturen in Taiwan und Korea realisieren. So ist

die taiwanische imec-Niederlassung im Hsinchu Science Park angesiedelt, einem der weltweit führenden Halbleiter-Cluster.

Nicht zuletzt ist die Gewinnung von Wissenschaftlern und hochqualifizierten Fachkräften nach wie vor ein Motiv empfangender Länder. Insofern werden Forschungsaktivitäten und gemeinsame Projekte in der Regel durch gemeinsame Studienprogramme ergänzt. Dies ist meist von gemeinsamem Nutzen, insbesondere dann, wenn auch Studierende aus den entsendenden Ländern an diesen Programmen teilnehmen können. Denn so werden auf allen Seiten Wissenschaftler mit hoher interkultureller Kompetenz ausgebildet, welche in Zukunft eine wesentliche Rolle bei der Internationalisierung führender Hightech-Cluster spielen werden.

Cluster Hsinchu

Der Hsinchu Science Park liegt im Nordwesten Taiwans und gilt sowohl als weltweites Zentrum der Halbleiter-Industrie als auch als Mittelpunkt der taiwanischen Hightech-Industrie. Weitere Schwerpunkte liegen im Präzisionsmaschinenbau, der Optoelektronik, der Computerindustrie, der grünen Energie sowie der Solarzellenindustrie. Unternehmen wie Acer, BenQ, Logitech und Foxconn haben hier ihre größten Fertigungsstätten, auch Philips, Realtek und Microtech sind vertreten.

Aufgrund der beeindruckenden Entwicklung in den letzten 30 Jahren gilt Hsinchu für den asiatischen Raum als das Vorzeigebispiel eines staatlich geplanten Wissenschaftsparks. Von 1978 bis 2012 investierte die taiwanische Regierung umgerechnet über zwei Milliarden Euro in die Entwicklung des Parks. 1985 gab es dort bereits 50 Unternehmen; heute sind es über 480 Mieter mit über 148.000 Beschäftigten. Im Jahr 2012 betrug der Umsatz der ansässigen Unternehmen 27,5 Milliarden Euro.

Dr. Silke Stahl-Rolf

Download

Entwicklung von Kompetenzclustern und -netzen zu internationalen Kompetenzknoten, VDI Technologiezentrum GmbH, Düsseldorf 2008

→ http://www.kooperation-international.de/fileadmin/public/downloads/news/Internationalisierung_von_Clustern_und_Netzen.pdf

Ausführliche Clusterporträts aus Asien bei Kooperation international

Cluster Shanghai (China)

→ <http://www.kooperation-international.de/clusterportal/cluster-shanghai.html>

Cluster Shenzhen (China)

→ <http://www.kooperation-international.de/clusterportal/shenzhen.html>

Cluster Suzhou (China)

→ <http://www.kooperation-international.de/clusterportal/cluster-suzhou.html>

Cluster Xuzhou (China)

→ <http://www.kooperation-international.de/clusterportal/cluster-xuzhou.html>

Cluster Zhongguancun (China)

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Cluster Bangalore (Indien)

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Cluster Hyderabad (Indien)

→ <http://www.kooperation-international.de/clusterportal/cluster-hyderabad.html>

Cluster Pune (Indien)

→ <http://www.kooperation-international.de/clusterportal/cluster-pune.html>

Cluster Tokio/ Kanto Region (Japan)

→ <http://www.kooperation-international.de/clusterportal/cluster-tokio-kanto-region.html>

Kitakyushu Eco Town (Japan)

→ <http://www.kooperation-international.de/clusterportal/kitakyushu-eco-town.html>

Cluster Kuala Lumpur/ Penang (Malaysia)

→ <http://www.kooperation-international.de/clusterportal/cluster-kuala-lumpur-penang.html>

Cluster Ansan (Südkorea)

→ <http://www.kooperation-international.de/clusterportal/ansan.html>

Daedok Innopolis Science Park (Südkorea)

→ <http://www.kooperation-international.de/clusterportal/daedeok-innopolis-science-park.html>

Cluster Singapur (Singapur)

→ <http://www.kooperation-international.de/clusterportal/cluster-singapur.html>

Cluster Hsinchu (Taiwan)

→ <http://www.kooperation-international.de/clusterportal/cluster-hsinchu.html>

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The LIAMA Sino-European Laboratory

LIAMA, the Sino-European Laboratory in Computer Science, Automation and Applied Mathematics, is a research hub, with its main office hosted by CASIA, the Institute of Automation of the Chinese Academy of Sciences. LIAMA conducts research, training and transfer projects in computer science, automation and applied mathematics.

LIAMA was initially created by Inria (Inventors for the Digital World) and the Chinese Academy of Sciences (CAS) in January 1997, as a Sino-French laboratory to encourage scientific cooperation between the two institutions. The laboratory issued a call for joint projects and the best projects were selected and obtained funding from the two institutions.

As these projects were successful, successive calls were made and other institutions wanted to join, such as the French Centre National de la Recherche Scientifique (CNRS) that joined LIAMA in 2000. From 1997 to 2008, the laboratory evolved into a larger structure, with long term (over one year) exchanges of scientists across the two countries. Also the projects became larger with more staff and higher ambitions, as China's scientific level was emerging as world first class research. In 2008, the laboratory had grown to over 120 people (including PhD students and post-docs) with more than ten French scientists residing in China for a long stay.

In 2007, the partners felt that LIAMA should open its doors to new participants, in particular to enable collaboration with the top Chinese Universities, not only the Chinese Academy of Science, and also open to members of the European Union. Hence, LIAMA became a Sino-European laboratory in 2008, with new European (non-French) members joining the LIAMA Consortium. LIAMA then entered a new phase of international cooperation, expanding its research fields and disciplines, with increased involvement of its members. Formally, LIAMA is now a Consortium of Member Institutions: Founding Members elaborate the laboratory strategy, support the laboratory infrastructure and resources and are in charge of executive decisions; Associate Members support projects.

LIAMA's strategy, action plans and budget are decided by a Steering Committee from Member representatives. The Steering Committee meets annually. LIAMA operations are managed by a Directorate, formed by a Chinese Director and a European Director. LIAMA runs scientific research projects, aiming at worldwide excellence. Each research project of LIAMA is a cooperation between European and Chinese researchers, and is hosted by a partner institution in China, member of the Consortium. These scientific projects from LIAMA are evaluated every four years by a Visiting Committee to maintain world class research projects. LIAMA projects also contribute to training and education with PhD students, post-doctorate fellowships, and internships.

Because LIAMA is not a legal entity, but only a cooperation structure between its members, it does not own any intellectual property. The intellectual property resulting from the research projects belongs to the contributing members and to their institutions. There are general rules defined by the Consortium Agreement, which are similar to the European Union rules, but specific agreements must be mutually contracted by the partners of an individual project, if they want to enforce particular rules for that project. In the past, most software resulting from LIAMA projects has been open source software published with the copyrights notice of the authoring institutions.

The LIAMA Sino-European Laboratory is now a medium sized research laboratory with highest visibility in France and China. LIAMA is currently running twelve collaborative projects grouping over 250 people, distributed over five host institutions, of which three are in Beijing, one in Shanghai and one in Xi'An. In the past five years, the LIAMA projects have published over 160 joint publications with European and Chinese authors, and about 40 PhD students have graduated. To maintain its status as a center of excellence, LIAMA needs to grow and be more active. Opening cooperation to new European partners will help us achieve this goal.

Existing Research at LIAMA

There are no strict rules regarding the scope and technical contents of LIAMA projects, as long as they are related to science and technology of information and communications (informatics and applied mathematics). The projects have

changed in scope and duration in the past 16 years of existence of the laboratory. As of 2014, the LIAMA projects are organized around three domains of research:

- Information Technology for Life and Earth Science: In this panel, there are three projects run in two different locations. The projects in this panel are pluridisciplinary, cooperating with scientists in other domains.
- Scene Understanding: The three projects in this panel run in three different institutions and are related to understanding and constructing models regarding scenes from the real world, and includes 3D geometry modeling.
- Trustworthy Computing: This panel gathers six projects, distributed over four places, which are more related to core computer science, including future computer architecture, certification of algebraic computations, cryptography, modeling of cyber physical systems, and mobile telecommunications.

LIAMA Future

In recent years, developing LIAMA has been a constant challenge due to several encountered difficulties: first, it was not easy to attract senior researchers in China, because it is a common belief that local research environments do not match those in Europe; second, the turnover among the expatriated researchers does not help to maintain the continuity of LIAMA as a whole; third, European funding has been subjected to government policy changes (on both sides); and fourth, both China and European countries have regulations which can constrain the development of cooperative research laboratories.

The interest of scientific cooperation with China has both short term and long term objectives. China has experienced the strongest growth in scientific research over the past three decades of any country: it is now the third-largest producer of research articles, behind the European Union and the United States, and the research funding budget increases each year. The scientific level of Chinese laboratories has become world first class. There are many Chinese Master students looking forward to doing their PhD abroad, but their pole of

attraction today is mostly towards the USA. Having a Sino-European lab in China helps raising awareness about the excellence of European labs and the opportunities to complete a PhD or a post-doctoral fellowship in Europe. In the longer term, creating human relationships and friendship between Chinese and European citizens is an enabler for developing social networks that have economic impact.

The LIAMA consortium exists, but is still relatively small to let us accomplish our ambitions. The consortium was intended from its inception to help growing and maintaining the collaborative character of each project in the laboratory by attracting non-French European institutions to the consortium and their researchers to the laboratory. The move has already started, with one consortium member from the Netherlands (CWI) supporting two projects, and one member from Belgium (VUB) who initiated a new project with its partner university in Xi'An. Amplifying this move requires resources and increased visibility.

Scaling up LIAMA's activities requires new partners, new projects and new funding. The accession of new partners to LIAMA is needed to become a truly Sino-European laboratory and to maintain a sustainable size. LIAMA and its researchers would then be the catalyst building and increasing the coordination between Europe and China, through scientific cooperation and institutional introduction to China's ministries, research organisations and universities. Finally, in longer term and with a stronger position, LIAMA would

LIAMA current memberships

Founding Members:

CAS Institute of Automation (CASIA), East China Normal University (ECNU), Tsinghua University from China; CNRS, INRIA from France; and CWI from the Netherlands.

Associate Members:

CAS Institute of Mathematics and System Science (AMSS), CAS Institute of Computing Technology (ICT), CAS Institute of Software (ISCAS), CAS Institute of Remote Sensing and Digital Earth (RADI), Northwestern Polytechnic University (NPU), Peking University (BeiDa), University of Electronic Science and Technology (UESTC) from China; Vrije Universiteit Brussel (VUB) from Belgium; the Agricultural Research Centre for International Development (CIRAD), Institut Mines Telecom, Université Joseph Fourier, Université Technologique de Compiègne from France; and University of Wageningen from the Netherlands.

develop research relationships with the most important neighbouring research actors, in Japan, Korea and Taiwan.



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Weitere Informationen

LIAMA

→ <http://liama.ia.ac.cn/>

Inria

→ <http://www.inria.fr/en>

Chinese Academy of Sciences (CAS)

→ <http://english.cas.cn/>

Centre National de la Recherche Scientifique (CNRS)

→ <http://www.cnrs.fr/index.php>

Centrum Wiskunde & Informatica (CWI)

→ <http://www.cwi.nl/>

Vrije Universiteit Brussel (VUB)

→ <http://www.vub.ac.be/en>

CREATE Programmes by Singapore's National Research Foundation

The National Research Foundation (NRF) of Singapore was set up on 1 January 2006 as a department within the Prime Minister's Office. The NRF sets the national direction for research and development (R&D) by developing policies, plans and strategies for research, innovation and enterprise, funds strategic initiatives, builds up R&D capabilities and capacities through nurturing their own and attracting foreign talent, and coordinates the research agenda of different agencies to transform Singapore into a knowledge-intensive, innovative and entrepreneurial economy.

One of the many initiatives by the NRF is the Campus for Research Excellence and Technological Enterprise, commonly called CREATE. CREATE is an international collaboratory that houses research centres set up by top universities in collaboration with Singapore's universities and research institutes. Researchers from diverse disciplines and backgrounds work closely together to perform cutting edge research in strategic areas of interest that could lead to positive economical and societal outcomes for Singapore. Many top universities have already set up research facilities under the CREATE umbrella in different topics and have a physical presence in the CREATE Campus built by NRF.

The Singapore-MIT Alliance for Research and Technology (SMART) Centre within CREATE is the largest international research endeavour of MIT and has five inter-disciplinary groups spanning the areas infectious diseases, environmental sensing and modelling, biosystems and micromechanics, future urban mobility and low energy electronics systems.

Universities with a presence in the CREATE Campus are: Massachusetts Institute of Technology (MIT); Swiss Federal Institute of Technology (ETH) Zurich; University of California, Berkeley; Technical University of Munich (TUM); Technion – Israel Institute of Technology; Hebrew University of Jerusalem (HUJ); Ben-Gurion University (BGU); Peking University; Shanghai Jiaotong University and Cambridge University.

A future cities laboratory is set up by the Singapore-ETH Centre (see page 9) while TUM-CREATE partners Singapore's Nanyang Technological University

(NTU) for research and development in electromobility focussing on tropical megacities.

Technion-CREATE is a partnership between Technion – Israel Institute of Technology, NTU and the National University of Singapore (NUS) on regenerative medicine focussing on a tissue engineering based approach to cardiac restoration. The Hebrew University of Jerusalem (HUJ) has a NUS-HUJ-CREATE centre on cellular and molecular mechanisms of inflammation to accelerate the development of diagnostics and prognostics of common inflammatory diseases in Asia. The NTU-BGU-HUJ partnership with the Ben-Gurion University in Israel is on developing nanomaterials for water and energy management applications.

The Berkeley Education Alliance for Research in Singapore (BEARS) manages two programmes. One is on building energy efficiency in the tropics and the other is to harness solar energy in a cost-effective manner. The latter programme aims to improve the efficiency of photovoltaic systems and also harvest solar energy to reduce carbon dioxide into liquid fuels.

The Peking University, NTU and NUS work on carbon capture in algae bioreactors while the Shanghai Jiaotong University and NUS aim to develop a waste-to-energy system for urban environment.

Cambridge University is addressing the carbon footprint in the petrochemical and electrical networks in Singapore's Jurong Island industrial complex along with NTU and NUS.

The structure and requirements within each of these CREATE programmes vary somewhat depending on the magnitude of the research grant and the number of people involved. Typically, Principal Investigators (PI) are chosen in all participating universities and they form teams addressing different aspects of the programme. The main university that receives the funding from NRF will have a Programme Director while the other participating universities have a Lead-PI each who helps the Director to coordinate the research work. All PIs are required to spend substantial time doing and supervising research in the CREATE Campus while the overseas PIs are required to spend 6 to 12 months in Singapore over the period of the grant which is five years. The grant provides for some key equipment and facilities to be procured and commissioned in the

CREATE campus where each programme is given significant amount of space to set up a physical centre. In addition, facilities in NTU, NUS and the overseas



A view of the CREATE campus in Singapore that houses all the research centres; photo: DP Architects, Singapore

universities are also used to do the investigations. Researchers and students travel between the overseas partner university and Singapore both ways, providing an enriching experience for all involved. Thus, the strengths of all the institutions involved are compounded to produce excellent outcomes.

The research fund is awarded to a principal university by NRF but it is shared with the other partnering

universities depending on their expected contributions. Research manpower is recruited through the universities involved by way of sub-grants to partnering universities, but are stationed in the CREATE campus. Overseas recruitment by the overseas university could be stationed in the parent university to help the local researchers execute tasks overseas. However, they would come to Singapore to interact from time to time. Each programme plans and conducts workshops and seminars regularly in the CREATE campus where all researchers gather together to exchange information, views and criticism.

Hundreds of professors and scientists from these top foreign universities are working with those from the Singapore universities NTU and NUS in this CREATE campus which creates an excellent opportunity for multi-disciplinary research and cross-fertilization of ideas from people of diverse nationalities and backgrounds. The establishment of CREATE campus underscores the Government's strong commitment to invest in research infrastructure and capability development that will catalyse the transformation of Singapore's economy into one that is based on knowledge and innovation. At steady state, CREATE is expected to house more than 1,000 researchers from all over the world.

Besides the research output, the commitment of the people involved in the programmes is establishing strong bonds between the partnering universities on

many other aspects of the academic life. In some CREATE programmes the interaction between the partners is excellent, and that has promoted many bilateral relationships between the universities outside the CREATE framework. An example is the collaboration between UC Berkeley and NTU where student exchange at undergraduate level has become a key part of some of the engineering programmes in NTU. This is because UC Berkeley and its neighbour Lawrence Berkeley Laboratories view the CREATE programme as the beginning of wider collaboration between NTU, NUS and Singapore. This is the theme of their BEARS alliance with NRF, NTU and NUS. Thus, participation in CREATE is likely to lead to strong bonds between universities which will last beyond the life of the research programmes funded by NRF.

It must be noted that CREATE was named the "2013 Laboratory of the Year" by the US-based R&D Magazine. It has been recognized for excellence in research laboratory design, planning and construction. This is the third R&D facility outside USA, and the first in East Asia, to win this honour.



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Weitere Informationen

Campus for Research Excellence and Technological Enterprise (CREATE)

→ <http://www.nrf.gov.sg/about-nrf/programmes/create>

Singapore-MIT Alliance for Research and Technology (SMART)

→ <http://smart.mit.edu/>

Singapore-ETH Centre (SEC)

→ <http://www.futurecities.ethz.ch/about/sec/>

TUM-CREATE

→ <http://www.tum-create.edu.sg/>

NUS-HUJ-CREATE

→ <http://huj.nus.edu.sg/index.htm>

Berkeley Education Alliance for Research in Singapore (BEARS)

→ <http://crest.berkeley.edu/bears.html>

Indo-European Research Facilities for Studies on Marine Ecosystem and Climate in India (INDO-MARECLIM)

The INDO-MARECLIM project was conceptualised to expand the existing bilateral Indo-Norwegian collaboration of Nansen Environmental Research Centre India (NERCI) to a global level. NERCI as well as the parent institution Nansen Environmental Remote Sensing Centre (NERSC, Norway), is associated with the Plymouth Marine Laboratory (PML, UK), Alterra (The Netherlands), Centro Euro-Mediterraneo sui Cambiamenti Climatici (CMCC, Italy) and Institut français de recherche pour l'exploitation de la mer (Ifremer, France). The EU-INCO-LAB-India call under the 7th Framework Programme triggered the desire to establish scientific cooperation with the expertise of scientists of international standing to study Indian marine ecosystems and climate.

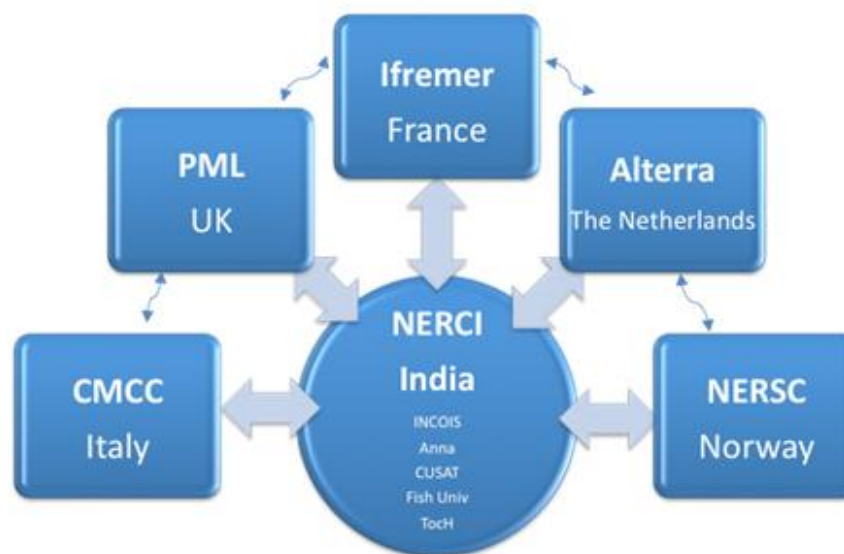
Third parties are involved to link the expertise of leading Indian institutions like Indian National Centre for Ocean Information Services (INCOIS), Anna University, Cochin University of Science and Technology (CUSAT), Kerala University of Fisheries and Ocean Studies (KUFOS), and Toc H Institute of Science and Technology (TIST) with the European counterpart to study ecosystems and related services in totality. The overall objective of the project is to extend NERCI as a joint research facility for scientific cooperation between India and the European Union in the focal areas of marine research.

INDO-MARECLIM is the first EU project to be implemented with an Indian institution as the Coordinator. Lack of knowledge of Euro-

pean Commission (EC) rules and routines in implementation of guidelines have caused some delay during the first half of the project. However, we could solve the problem with combined assistance from the scientists. Consortium partners work hand in hand in supplementing the project. The smooth functioning of the project is achieved through efficient planning. Project planning for INDO-MARECLIM is undertaken by the Executive Board. During each project review meeting, the work package (WP) leaders present the progress achieved to be scrutinised and discussed by the partners. Each sub-WP of WPs is completely under the charge of the respective leader, who monitors the progress of the work through regular telephone conversations, skype meetings, e-mails and exchange of results, documents and papers. EC has been very prompt in releasing the grant instalments in time.

What are legal and administrative framework conditions?

A number of key management and communication tools are used to ensure that the project runs efficiently and meets its objectives on time. The project office is set up at NERCI. The staff comprises the Coordinator, a project management team and a Finance Officer. A steering committee comprising the Chairman (Prof. Johannessen), a Coordinator, a Deputy Coordinator, a Manager and one representative from each partner monitors the progress. The Coordinator also organises and chairs progress meetings and steering committee meetings twice a year to ensure that the project remains on track. Financial management is done efficiently with the help of the finance staff of NERSC. In spite of the problems that the Coordinator faced regarding foreign exchange regulations with the Reserve Bank of India, the pre-financing amount was distributed to all project partners without any delay.



Consortium partners of the INDO-MARECLIM project

What resources are used?

Infrastructure and expertise at NERCI are used as a platform for interaction with European partners. NERCI infrastructure was developed to achieve the scientific objectives. Scientific facilities are available for collaboration. The computing infrastructure including a HP PROLIANT DL580 G7 server was installed for the application of ocean colour retrieval algorithm to estimate chlorophyll-a, TSM and DOC from satellite data, to run the coupled GOTM-ERSEM and the marine primary production (PP) model. The Weather Research and Forecasting Model (WRF) has been installed in the server to study the Indian monsoon and ocean variability. Softwares are installed at NERCI for the effective use of consortium partners. For the optical ocean research laboratory a newly purchased Ocean Profiler II (Satlantic) and UV-visible spectrophotometer (Shimadzu) are being used for bio-optical algorithm development, satellite calibration and validation, and environmental monitoring. Manpower at the partner institutions are the major human resources used.

What is the long term perspective?

The project and cooperation will contribute to building strategic R&D partnerships between institutions in Europe and India. Involvement of marine research institutions in India in the project would help in attaining better support from Indian bureaucracy. In short, through the scientific as well as training activities, INDO-MARECLIM aims at fostering Indo-European cooperation in the study of marine ecosystem and climate focusing on the Indian Ocean. The project also addresses societal issues through cost benefit analysis and models in relation to climate change. The knowledge gathered and the gaps identified will be utilized to develop joint project proposals to strengthen the consortium interaction. It is envisaged that a successful completion of INDO-MARECLIM will lead to more scientific cooperation between the EU and India through new projects with the participation of new partners, especially in the area of tropical marine ecosystem modelling and climate modelling.

What are the specific challenges among partner countries?

All partners have worked conjointly to fulfill the scientific objectives in time. Special INCO-LAB regulations, that the European partners should spend their efforts

(allocated project time) in India and at NERCI, is limiting efficient implementation of the project. Lack of sufficient effective time for scientific discussions and combined work posed a challenge.



Download

EU-INCO-LAB-India call

→ <http://www.indomareclim-nerci.in/publication/INDOMARECLIMOctNRMManagement.pdf>

Weitere Informationen

INDO-MARECLIM

→ <http://www.indomareclim-nerci.in>

Nansen Environmental Research Centre, India (NERCI)

→ <http://www.nerci.in>

Nansen Environmental and Remote Sensing Center (NERSC)

→ <http://www.nersc.no/>

Plymouth Marine Laboratory (PML)

→ <http://www.pml.ac.uk>

Alterra

→ <http://www.wageningenur.nl/nl/Expertises-Dienstverlening/Onderzoeksinstituten/Alterra.htm>

Centro Euro-mediterraneo sui Cambiamenti Climatici (CMCC)

→ <http://www.cmcc.it/>

Institut français de recherche pour l'exploitation de la mer (Ifremer)

→ http://www.ifremer.fr/institut_eng

Indian National Centre for Ocean Information (INCOIS)

→ <http://www.incois.gov.in/Incois/incois1024/index/index.jsp?res=1024>

Anna University Chennai

→ <http://www.annauniv.edu/>

Cochin University of Science and Technology (CUSAT)

→ <http://www.cusat.ac.in/>

Kerala University of Fisheries and Ocean Studies (KUFOS)

→ <http://www.kufos.ac.in/>

Toc H Institute of Science and Technology (TIST)

→ <http://www.tistcochin.edu.in/>

VTT Korea – an Innovation Satellite in the Middle of a High-Technology Environment

The VTT Technical Research Centre of Finland is a globally networked multitechnological applied research organization. VTT provides high-end technology solutions and innovation services. We enhance our customers' competitiveness, thereby creating prerequisites for society's sustainable development, employment, and wellbeing.

In the middle of the 2000s decade, VTT evaluated different foreign countries in order to find a good place to make business and perform R&D. Based on this analysis, South Korea was selected as a country to set up an office and develop it into a research unit. The Korea branch office of VTT International, VTT's company for managing and developing international sites, was established in 2008 as the first branch office of VTT abroad. Reasons for this choice were the strong drive of Korean companies and R&D players to develop world class products in a large number of areas. Korea appeared to be one of the leading countries in technology development with a high level of investment in R&D in relation to its GDP, in which it is similar to Finland. Moreover, the atmosphere for foreign public organizations to enter into the Korean R&D market was favourable. However, the market in Korea is very challenging and competitive in terms of competence, speed and price competition.

In Korea, VTT is focusing on information and communication technologies (ICT), electronics and their solutions for heavy industry. In the research development work, VTT's main activities lie in product development. Korean partners usually want to see a demonstration or get a prototype of the product. Marketing and interaction with the Korean counterparts are undertaken by VTT Korea and VTT Finland depending on the application domain and competence. In order to operate and offer versatile services for its customers, VTT Finland provides technology and personnel backup for the operations and some of the projects are carried out in Korea, some in Finland, depending on the expertise required. VTT Korea works for both customer projects and publicly funded projects just as its mother institute in Finland.

Among VTT Korea's success stories count the development of Home Automation and data analysis for well-being purposes, a communication and localization device for maintenance service staff in factories and power plants, energy harvesting solutions for demanding industrial measurement systems and next-generation printed electronics. Strong collaboration with Korean partners is realized in the joint research centre with Konkuk University and the joint research laboratory with the Electronics and Telecommunication Research Institute ETRI.

One important form of cooperation with Korean counterparts is the exchange of personnel. In the case of VTT, it is done in both directions: researchers from VTT in Finland are working at VTT Korea or on the customer's premises. Likewise, employees of partners and stakeholders from Korea visit VTT in Finland for shorter or longer periods. This exchange creates an excellent collaboration model for long-term partnerships.

Concerning its legal structure, VTT Korea is a branch office of VTT International and is a local legal entity. VTT Korea runs offices in Seoul and Daejeon with both Korean and Finnish personnel.

In the future, VTT Korea will be a R&D institute focusing on service to Korean customers and public players. It strives to be a hub between Finland and Korea for all technology services that VTT will provide. To this end, VTT Korea utilizes the special characteristics of the Finnish innovation system which is one of its unique competences for the Korean market.



Mikko Sallinen
Vice President
VTT Korea
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Weitere Informationen

VTT Korea
→ <http://www.vttkorea.com>

The Saw Swee Hock School of Public Health: Establishing an International Research Presence

As an institution of public health centred in Asia, the Saw Swee Hock School of Public Health (SSHSPH) at the National University of Singapore (NUS) is able to capitalise on its geographical and cultural advantages to increase its regional and international presence.

SSHSPH, formally established in 2011, builds upon over 60 years of experience in research, training and practice as a Department of Epidemiology and Public Health. As a school of public health located within a comprehensive university, SSHSPH also leverages on expertise and multi-disciplinary networks within and across NUS. Some examples include collaborations with the arts and social sciences, computing, and engineering. The School prioritises its funding resources for regional engagements, complementing locally-obtained funds from the National Research Foundation (NRF) and Temasek Foundation with international sources such as the US National Institutes of Health (US NIH), the US Agency for International Development (USAID), Wellcome Trust and Asia-Pacific Economic Cooperation (APEC).

Capacity building: regional partnerships and events

The School's current research presence in the Asia-Pacific has emerged through various capacity-building collaborations in neighbouring countries such as Myanmar, the Philippines, Thailand, Malaysia, and Vietnam. In collaboration with host and partner institutions in these countries, SSHSPH conducts training programmes aimed at building and developing the ground-level capabilities of our regional partners in the areas of public health policy formation and spe-



Capacity building in Myanmar; photo: Saw Swee Hock School of Public Health, National University of Singapore

cialised technical capabilities in health sector areas such as epidemiology, genomics, workplace safety and health, and translational research methodologies.

The School, in collaboration with other partner organisations, also co-organises events such as the Singapore International Public Health Conference (SIPHC) and the NUS Initiative to Improve Health in Asia (NIHA), avenues which seek to elevate the quality of public health and healthcare delivery in Asia. With the Chapter of Public Health and Occupational Physicians, Academy of Medicine, Singapore, SSHSPH co-organised the SIPHC, which invites international and local delegates from government agencies, research and higher learning institutions, healthcare agencies, multilaterals and civil society to share ideas and drive action to address current public health challenges regionally and beyond. The NIHA, held in collaboration with the NUS Global Asia Institute (GAI), the Lee Kuan Yew School of Public Policy, Yong Loo Lin School of Medicine and the NUS Business School, comprises an executive portfolio of cutting-edge research, high-level forums and leadership programmes. The event sees local, regional and international healthcare decision-makers, healthcare policy academics, and industry experts seek integrative and multidisciplinary solutions to public health issues.

The SSHSPH has also collaborated with the Harvard School of Public Health (HSPH) to jointly launch the Asian Diabetes Prevention Initiative (ADPI) website, among a range of ADPI-related activities, aimed at combating the growing epidemic of diabetes in Asia. The project was helmed by several researchers and faculty from HSPH, and Associate Professor Rob van Dam from SSHSPH, who also holds an adjunct position at HSPH and is co-editorial director of the website. As part of his research efforts in the areas of nutritional epidemiology, Assoc. Prof. van Dam also partnered with HSPH's Department of Nutrition, Culinary Institute of America and Health Promotion Board, Singapore in presenting the "Worlds of Healthy Flavours Asia" conference, an educational initiative for foodservice and healthcare leaders.

Joint research programmes

Presently, SSHSPH collaborates with a host of regional countries in Southeast Asia such Myanmar, the Philippines, Thailand, Malaysia and Vietnam to develop

joint research programmes in the areas of infectious diseases, metabolic and cardiovascular diseases, and health systems research.

Through funding from the US Agency for International Development (USAID), the London School of Hygiene and Tropical Medicine (LSHTM) is leading a two-year collaborative research programme on multi-drug resistant tuberculosis (MDRTB) with SSHSPH, the University of Public Health, Yangon, and the national tuberculosis programmes in Myanmar and Yunnan Province, China. The programme will analyse risks associated with MDRTB, health systems' constraints to control, and the economics of control. Both Schools have also jointly developed a short course on vaccinology, which will see faculty from Schools lending their teaching expertise to the course.

International expertise

Foreign internationals from various countries constitute about a third of the School's Principal Investigators (PIs) conducting research. They bring with them a wealth of networking associations from their countries that could potentially promote international collaborative tie-ups.

Prof. Richard Coker, who is a visiting professor from the LSHTM, currently heads the Infectious Diseases Programme at SSHSPH, a research-strong programme that has undertaken several projects aimed at improving health-related practice, policy and research, including investigating determinants of influenza vaccination in healthcare workers, modelling interventions against potential epidemics in Singapore, and pilot studies for the prevention of HIV and other sexually transmitted infections.

Other faculty members with ties to other international institutions include Dr. Joanne Yoong, a health economist holding a joint position as Director at the University of Southern California's Centre for Economic and Social Research (CESR-East), and Prof. Bert Vrijhoef, who spearheads research collaborations in health systems and policy with students on research attachments from Vrije Universiteit (Free University) and Maastricht University in the Netherlands, as well as Assoc. Prof. Mikael Hartman, who is building collaborations with Karolinska Institute (Sweden) and Utrecht University (Netherlands) in breast cancer research and clinical epidemiology. In a bid to raise funds and interna-

tional awareness for breast cancer research, Assoc. Prof. Hartman also recently embarked on "The Long Ride 2014: Singapore to Sweden for Breast Cancer Research", together with fellow breast cancer surgeon Assoc. Prof. Philip lau, an effort which will see the two ride across 17 countries in Asia and Europe by motorcycle, stopping at various destinations to conduct seminars, classes and demonstrations with an existing network of collaborators.

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Weitere Informationen

Saw Swee Hock School of Public Health (SSHSPH)

→ <http://www.sph.nus.edu.sg/index.php>

National University of Singapore (NUS)

→ <http://www.nus.edu.sg/>

National Research Foundation (NRF)

→ <http://www.nrf.gov.sg/>

Temasek Foundation

→ <http://www.temasekfoundation.org.sg/>

US National Institutes of Health (NIH)

→ <http://www.nih.gov/>

US Agency for International Development (USAID)

→ <http://www.usaid.gov/>

Wellcome Trust

→ <http://www.wellcome.ac.uk/>

Asia-Pacific Economic Cooperation (APEC)

→ <http://www.apec.org/>

Singapore International Public Health Conference (SIPHC)

→ <http://www.phconference.org/yr2012/index.html>

NUS Initiative to Improve Health in Asia (NIHA)

→ <http://www.gai.nus.edu.sg/niha/>

Asian Diabetes Prevention Initiative (ADPI)

→ <http://asiandiabetesprevention.org/>

The Long Ride 2014: Singapore to Sweden for Breast Cancer Research

→ <http://medicine.nus.edu.sg/medsur/thelongride/>

The Oxford University Clinical Research Unit in Vietnam

The Oxford University Clinical Research Unit (OUCRU) in Vietnam is one of the Wellcome Trust Major Overseas Programmes and is recognized internationally for its excellence in research in the area of infectious diseases. The unit was established in 1991 in collaboration with the Hospital for Tropical Diseases in Ho Chi Minh City, and later in Hanoi in 2006.

Our research programme aims to tackle infectious disease health problems that have both local and global relevance. In the early days of the unit, the work focused on malaria and typhoid fever and was able to bring ground breaking new knowledge to the field. The programme has been growing ever since. Since 2001, OUCRU has published more than 800 research articles, with more than 50 publications in top journals like New England Journal of Medicine, Science, Nature, and Lancet (see infobox for key achievements).

The work of the unit covers clinical and public health research and includes work in immunology, host and pathogen genetics, molecular biology, virology, mathematical modeling, bioinformatics, biostatistics and epidemiology. This work is all supported by an extensive Clinical Trials Unit and Data Management Centre compliant with national and international regulations and a comprehensive Management, Finance and Administrative Centre. Our research concentrates on the following core areas: central nervous system infections and HIV, dengue, emerging infections, enteric infections, respiratory infections including influenza, malaria, tuberculosis, zoonoses and antimicrobial resistance.

Current research activity includes seventeen clinical trials and over one hundred observational studies. Our trials explore novel drug treatments, indications or regimens for infectious diseases of public health importance and are designed to maximise the impact of the outcomes by integrating health economic evaluation, pharmacokinetic and pharmacodynamic analysis, epidemiological studies, diagnostic and prognostic investigations, pathogen studies and exploration of relevant genetic factors. Our multinational portfolio of observational studies focuses on diagnosis, characterization and/or prevention of emerging infections, drug resistance, pathogen transmission, and emerging infectious diseases, including zoonoses.

OUCRU and its partners have made major contributions to research across a range of infectious diseases

Influenza

- Delivered the first comprehensive report detailing the clinical features of avian influenza.
- In collaboration with Asian partners conducted a randomized clinical trial studying the efficacy of double dose versus standard oseltamivir for severe influenza.
- Running for over six years a community cohort to study the transmission dynamics of influenza and the role of immunity.

Dengue

- Determined the host and viral factors associated with severe dengue fever.
- Improved diagnostic tests for early identification of infection.
- Randomised controlled trials defining the optimal management of severe dengue fever.
- Linked the phenomenon of antibody dependent enhancement of dengue virus infection with the age-related epidemiology of severe dengue in infants.
- Coordinated an eight-country, two-continent network on dengue.

Enterics

- Defined the optimal antibiotic treatment of enteric fever through a series of randomized controlled trials.
- Understanding of the evolution and spread of important enteric pathogens.

Malaria

- Played a major role in establishing the role of artemisinin derivatives for the treatment of falciparum malaria.
- Helped to establish the burden of vivax malaria in Southeast Asia, showing that vivax is common and can cause severe disease.

Central nervous system infections

- Demonstrated adjunctive corticosteroids improves survival from tuberculous meningitis.
- Demonstrated the addition of flucytosine to amphotericin B improves survival from cryptococcal meningitis.

Other

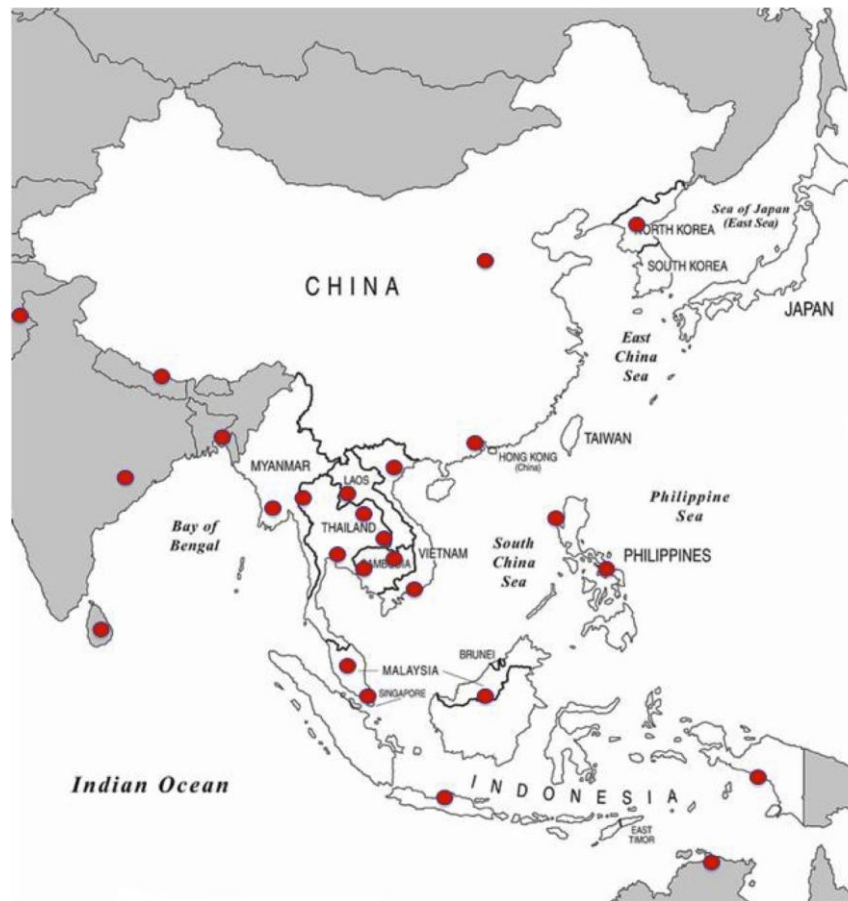
- Performed studies that have led to a reduction in mortality for patients with tetanus from 40 to 5 %.
- Conducted host genetic studies and identified key mutations in innate immunity genes that appear to play a role in susceptibility to tuberculosis meningitis and typhoid in the Vietnamese population.
- Set up a network to study hospital acquired infections and antimicrobial resistance.
- Set up international working groups for studies on infectious diseases of the central nervous system and emerging infections, bringing together scientists who have conducted clinical trials on these diseases.

OUCRU and its partners have led a highly successful effort in enhancing the infrastructure and capacity to perform clinical trials and basic scientific research in Vietnam, as well as in other parts of South and Southeast Asia. Our researchers collaborate widely across Vietnam and also with research groups throughout the rest of Asia. In particular we have helped establish the Eijkman-Oxford Clinical Research Unit in Jakarta, Indonesia; the Patan-Oxford Clinical Research Unit in Kathmandu, Nepal; and the Shantou-Oxford Clinical Research Unit in Shantou, China (see figure).

A major part of our mission is to develop Vietnamese science and scientists. We have a formal training programme for Vietnamese scientists, from undergraduate to postgraduate studies, with many students registered for Masters and PhD degrees at Vietnamese or international universities. Through these efforts, OUCRU is helping to build a critical mass of Vietnamese clinical and laboratory researchers dedicated to the country's scientific development.

Management of the OUCRU and its research

In October 2013, Guy Thwaites took over from Jeremy Farrar as Director of OUCRU. Jeremy Farrar is now Director of the Wellcome Trust, UK. Dr. Thwaites is responsible for all OUCRU activities, but in particular defining and leading the Unit's overall scientific strategy with the Unit's Strategic Committee. Besides the Strategic Committee, he is supported by Tran Tinh Hien (Director of Clinical Research), Sarah Barton (Director of Operations), and the Directors of the linked



Major Regional Networks integrated within the Wellcome Trust SE Asia Program

Research Units in Hanoi (Dr. Wertheim), Kathmandu (Dr. Basnyat), Jakarta (Dr. Baird) and Shantou (Dr. Ba-Thien).

The Research Units in Ho Chi Minh City and Hanoi are embedded within the country's two tertiary referral hospitals for infectious and tropical diseases (Hospital for Tropical Diseases, Ho Chi Minh City, and National Hospital for Tropical Diseases, Hanoi). In this context, OUCRU has the strong support of the Vietnamese government, and works closely with the Ministry of Health Vietnam and the Department of Health of Ho Chi Minh City. We have also developed strong links with more than 20 other Vietnamese hospitals and research institutions including the National Institute of Hygiene and Epidemiology (NIHE), and Hanoi Medical University.

The University of Oxford acts as regulatory sponsor for all grant-funded OUCRU research. The Ethical Committees of all involved hospitals, the responsible local health administrations, and the Oxford Tropical Research Ethics Committee approve all research studies prior to initiation. In addition, the Ethical Committee of the Vietnam Ministry of Health or

other equivalent authorities at international sites also approve clinical trials. Subject to all ethics approvals being in place, the University provides all relevant and appropriate insurance coverage.

All OUCRU clinical trials join an international clinical trial registry, which meets the requirements of the International Committee of Medical Journal Editors. Registration increases the availability of all evidence in order to help inform health care decisions, prevents publication bias and selective reporting, increases

awareness of similar trials in order to avoid unnecessary duplication, helps identify gaps in clinical trials research, facilitates recruitment, promotes collaboration and the possibility of meta-analysis and increases access for peer review.

Public engagement

OUCRU is committed to conducting research in an ethical and integrated manner. To this end, we have an active public engagement department, which runs a range of science related activities for the Vietnamese public. Some of our public engagement activities include:

- Taking science into schools with a comedy Science Theatre show about enteric diseases and antibiotic resistance.
- Science Cafés to encourage debate on current scientific issues.
- Training for science journalists.
- Digital story telling in various communities affected by health issues.
- An Artist in Residence scheme bringing a local artist into a science environment for inspiration.

We seek to engage with the communities who take part in our research, to inform about our projects and enable participation for all stakeholders.

We aim to have a positive and significant impact on global health and, in particular, the prevention, diagnosis and treatment of infectious diseases. This is being achieved via an integrated long-term research programme, contributions to training, the scientific literature, national and international meetings and membership of national and international committees. Priority is given to health issues important to the hospitals, and to Vietnam as a whole. All work is intended not only to benefit the patients seen daily at our host hospitals, but also to help improve patient care throughout the country.

Funding

Inaugural funding to establish OUCRU was provided by the Wellcome Trust who have continued to be the Unit's primary funder of operations and research activities for more than twenty years. Other partners have played a role in

allowing the programme to expand leading to diversification of funding sources over the past decade. Major partners include the National Institutes of Health (USA), Department for International Development (UK), National Health and Medical Research Council (Australia), Li Ka Shing Foundation (China), European Union, Bill and Melinda Gates Foundation (USA), Medical Research Council (UK) and a number of industry partners.

OUCRU's research programme has expanded substantially over the last 23 years. Our challenge is to remain a leader in the field of infectious diseases in the region and internationally.

Dr. Guy Thwaites
Director OUCRU Vietnam

Dr. Heiman Wertheim
Director of Unit OUCRU Hanoi

Sarah Barton
Director of Operations

Laura Merson
Head of Clinical Trials Unit

Wellcome Trust Major Overseas Program,
Vietnam; Oxford University Clinical Research
Unit

Hanoi, Vietnam

Weitere Informationen

Oxford University Clinical Research Unit

→ <http://www.oucru.org>

Wellcome Trust

→ <http://www.wellcome.ac.uk/>

Vietnam's First International University

The Royal Melbourne Institute of Technology (RMIT) is a global university of technology and design and Australia's largest tertiary institution. In 1998, RMIT was invited by the Vietnamese government to establish the country's first international university. After establishing its presence in the country in 2000, RMIT Vietnam began teaching at its Ho Chi Minh City campus in 2001 and in 2004 in Hanoi.

RMIT Vietnam now operates the world's largest international university branch campus. It has seen more than 6,500 graduates over the past decade and operates as a self-sustaining entity employing around 600 people, more than half of whom are Vietnamese. RMIT Vietnam's international staff bring global expertise and experience from more than 25 countries across the world, creating a dynamic environment for the delivery of an internationally accredited education at an English speaking campus.

Over the past ten years, RMIT Vietnam has awarded nearly 600 scholarships to outstanding high school students at a total value of over US\$ 4 million. In 2014, the university quadrupled the number of scholarships available for prospective students. RMIT Vietnam graduates are work-ready and highly sought after by employers for their international outlook and multicultural orientation, creative and practical problem-solving skills, strong teamwork and leadership capabilities.

RMIT Vietnam educates Vietnamese government officials through programs such as the Asia Region Law Enforcement Management Program at its Hanoi campus. The program for senior police representatives from ASEAN countries and beyond is the result of a long-standing partnership with the Australian Federal Police and the Vietnamese police service, in cooperation with other police forces. RMIT Vietnam also delivers the Border Control

Agency Management Program for Vietnamese migration managers across a range of government agencies including immigration, customs, foreign affairs, border guard and security departments, and ministries.

In 2014, RMIT Vietnam was awarded its eleventh Golden Dragon Award, an award program recognising foreign-invested companies in areas of outstanding business performance and making a significant contribution to the development of Vietnam's economy. RMIT Vietnam was also the only university selected as a winner in the 2014 Top Trades Services Awards, which saw 105 winners from over 400 applications by both domestic and foreign invested enterprises. The award acknowledged the university's positive contribution to Vietnam's economic development.

Permission and funding

A key factor underpinning the Vietnamese government's support for foreign investment in higher education has been the focus on full foreign ownership and independent international curricula for universities to act as a model and training ground in the development of capacity across the education, training and research sectors.



RMIT Library in Ho Chi Minh City; photo: RMIT University Vietnam & Nguyen Van Linh

Since receiving its investment licence from the Ministry of Planning and Investment in 2000, RMIT Vietnam continues to invest in people, buildings and facilities across its sites in Vietnam. The university's establishment was financed through a philanthropic donation from Atlantic Philanthropies and a loan by the Asian Development Bank and the International Finance Corporation. The Australian government and Victorian state government provided advice and necessary approvals to assist in the establishment of RMIT Vietnam.

RMIT's global approach

As a global university of technology and design, RMIT's approach to education and research

emphasises learning from action and experience, from studios to work placements, from research with industry to projects that develop cities and communities.

RMIT has four research institutes covering design, global cities, health innovations and platform technologies. The research supported in these institutes and through associated research centres is cross-disciplinary, drawing researchers from across the university.

The themes currently captured in this research are the future of cities; improving health and lifestyle; smart devices and technology solutions; designing the future; and sustainability and climate change. RMIT Vietnam provides a focus for research in RMIT's areas of specialisation.

In 2012, RMIT Vietnam academics developed a groundbreaking tool to help businesses in Southeast Asia prioritise security threats to better protect their organisations from cyber-attacks.

RMIT Vietnam academics worked with Australian academics to publish a handbook in 2014 on sustainable development issues in Southeast Asia, the first resource of its kind in the region.

A study is currently underway by RMIT Vietnam in collaboration with the Asia Injury Prevention Foundation to examine the impact of social marketing to improve road safety and driver attitudes.

Future focus

A commitment to growth, quality and differentiation sets the future focus for RMIT Vietnam. The university's priority for growth includes a rise in student intake, an expansion of academic programs as well as development plans for buildings and facilities across all university sites at Ho Chi Minh City and Hanoi.

RMIT Vietnam is working towards growing the number of students from its current total of just over 6,000 to 15,000 by 2020.

Over the next two years, refurbishments are planned for buildings at Ho Chi Minh City as well as a move in Hanoi to either a purpose built facility or to a

refurbishment of an existing site which will meet the university's design, technology and sustainability requirements.

A new learning management system will combine the delivery of RMIT Vietnam's curriculum with cutting edge technology, enhancing students' learning experience through resources such as lectures available as podcasts, online feedback mechanisms as well as video rich learning materials.

RMIT Vietnam will continue to bring an advantage and point of difference for students through its strong links with industry leaders, which often lead to internship opportunities as well as graduate employment.

Tasked with building on RMIT Vietnam's achievements to date and to lead the university to future success is new RMIT Vietnam President Professor Gael McDonald, who began her tenure at the university in mid-February 2014.

Karen Matthews
Chief Editor
Royal Melbourne Institute of Technology
Ho Chi Minh City, Vietnam

Weitere Informationen

RMIT Vietnam

→ <http://www.rmit.edu.vn/>

Royal Melbourne Institute of Technology

→ <http://www.rmit.edu.au/>

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