

Vielfalt und Synergie: Multilaterale Kooperationen

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Editorial

In den bisherigen Schwerpunktausgaben des *ITB infoservice* wurden die Bildungs-, Forschungs- und Innovationssysteme ausgesuchter Regionen bzw. großer Länder wie Russland beleuchtet. Im Blickpunkt standen dabei vor allem nationale Einrichtungen und Programme, bilaterale Kooperationen und intra-regionale Netzwerke.

Die vorliegende siebte Schwerpunktausgabe beschäftigt sich hingegen mit verschiedenen Aspekten multilateraler Kooperation und setzt einen Fokus auf globale und europäische Einrichtungen und Netzwerke mit dem Ziel, den Lesern einen Einblick in die große Bandbreite staatlicher und nichtstaatlicher Zusammenarbeit zu geben.

Dank der fachkompetenten Gastautoren und Interviewpartner, die für die inhaltliche Ausgestaltung dieser Schwerpunktausgabe gewonnen werden konnten, beleuchten wir in vier Themenblöcken unterschiedliche Aspekte der multilateralen Zusammenarbeit. Zunächst werden beispielhaft vier Institutionen vorgestellt, die auf einer multilateralen Basis Forschung und Entwicklung vorantreiben. Im zweiten Teil geht es um multilaterale Institutionen und Gremien, die sich auf die Sammlung von Daten und Informationen zu Bildung und Forschung konzentrieren und damit eine Grundlage für das internationale Monitoring bieten. Daran anknüpfend zeigt der dritte Teil Beispiele von Gremien und Initiativen auf, deren Ziel die Beratung zu Bildungs- und Forschungsthemen ist.

Im vierten Teil schließlich wird gezeigt, dass multilaterale Zusammenarbeit mehr oder weniger intensiv ausgestaltet werden kann: Das reicht von der Koordination nationaler Förderprogramme über gemeinsame Ausschreibungen von Förderorganisationen bis hin zu den großen Förderprogrammen der EU, die von gemeinsamen Einrichtungen administriert werden. Zusätzliches multilaterales Handlungspotential entwickelt seit 2012 der *Global Research Council*, ein globales Forum von Förder- und Forschungsorganisationen. Gründervater Subra Suresh erläutert in einem Interview dessen Ziele und Ansätze.

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Ausführliche Informationen über multilaterale Zusammenarbeit bei Kooperation international

Fokus G8/G20

→ http://www.kooperation-international.de/g8_g20

Fokus OECD

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

Fokus UNESCO

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

Fokus Global

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

Fokus EU

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



International Verantwortung übernehmen: Welche Rolle spielen multilaterale Organisationen und Netzwerke?

Angesichts fortschreitender Globalisierungsprozesse können nationale Bildungs-, Forschungs- und Innovationssysteme nicht mehr isoliert voneinander operieren: Sie benötigen den internationalen Vergleich, um sich Gewissheit über ihre Leistungsfähigkeit zu verschaffen und um voneinander zu lernen. Eine auf internationaler Ebene zunehmend vernetzte Wissenschaft ist darüber hinaus immer stärker an globalen Standards interessiert. Schließlich werden Organisationen benötigt, die zur Bewältigung von globalen Herausforderungen eine solide wissenschaftliche Entscheidungsgrundlage liefern.

Diese Schwerpunktausgabe beleuchtet die bildungs- und forschungsbezogenen Aktivitäten von diversen multilateralen Organisationen und Netzwerken. Multilateral wird im weiten Sinne verstanden: Neben internationalen Zusammenschlüssen von Staaten in zwischenstaatlichen Organisationen werden auch internationale Vernetzungen und Foren von Nichtregierungsorganisationen (z. B. Förderinstitutionen und berufsständische Organisationen) beschrieben. Einige der hier vorgestellten zwischenstaatlichen Organisationen – OECD, UNESCO und EU – haben ein breites politisches Mandat, das eine Vielfalt von Aktivitäten im Bildungs- und Forschungsbereich ermöglicht. Andere Organisationen wie der Weltklimarat IPCC sind thematisch eingeschränkter.

Nur in ausgesuchten Fällen werden multilaterale Organisationen von Staaten gegründet, um Forschung und Entwicklung (FuE) darin gemeinsam durchzuführen. Typischerweise ist dies der Fall, wenn teure technische Infrastrukturen notwendig sind, die eine Vielzahl von Staaten gemeinsam finanzieren und nutzen (z. B. CERN (vgl. S. 7 f.)). Ähnlich können große Weltraumprogramme wie die Ariane oder die bemannte Raumfahrt nicht durch einzelne europäische Nationen durchgeführt werden, sondern nur durch gemeinsame Anstrengungen im Rahmen der europäischen Raumfahrtagentur ESA (vgl. S. 9 f.). Der Aufbau der Uni-

ted Nations University zielt hingegen darauf ab, die Umsetzung der multilateralen UN-Agenda durch Bereitstellung wissenschaftlicher Ausbildungs- und Forschungskapazitäten zu unterstützen (vgl. S. 13 f.).

Bildung wird überwiegend jedoch weiterhin innerhalb nationaler Bildungssysteme vermittelt, ebenso wie FuE größtenteils innerhalb nationaler Forschungs- und Innovationssysteme durchgeführt wird. Wie das Beispiel der Internationalen Energieagentur (IEA) zeigt, können multilaterale Organisationen jedoch die Rolle eines „Maklers“ übernehmen, wenn einzelne Staaten einen aktuellen FuE-Bedarf nicht durch nationale Ressourcen abdecken können. Im Rahmen der sogenannten *Implementing Agreements* der IEA kann eine multilaterale FuE-Kooperation zwischen interessierten Staaten flexibel organisiert werden, häufig unter Einbeziehung von Unternehmen (vgl. S. 11 f.).

In den nationalen Bildungs- und Forschungssystemen ist eine Vielzahl von Akteuren tätig: Neben nationalen Ministerien gibt es Schulen, Berufsbildungseinrichtungen, Akademien, Hochschulen, außeruniversitäre Forschungseinrichtungen sowie nationale FuE-Förderorganisationen. Traditionell pflegen viele Staaten in Wissenschaft und Forschung die bilaterale Zusammenarbeit mit anderen Staaten. Neben multilateralen Organisationen mit globalem Anspruch (UNESCO, OECD) ist auch die regionale Ebene zunehmend aktiv: Insbesondere die EU verfolgt sowohl in der Bildung als auch der Forschung ehrgeizige Ziele (z. B. Europäischer Hochschulraum und Europäischer Forschungsraum). In sogenannten „Mehrebenensystemen“ mit multiplen Akteuren gibt es typischerweise großen Informations- und Abstimmungsbedarf. Multilaterale Kooperation nimmt vor diesem Hintergrund verschiedene Aufgaben wahr: Monitoring, Politikberatung, Koordination und Förderung.

Monitoring

Multilaterale Organisationen sind ideal platziert, um Informationen über die Bildungs- und Forschungssysteme ihrer Mitgliedsländer zu sammeln und diese politischen Entscheidungsträgern bzw. einer interessierten Öffentlichkeit zur Verfügung zu stellen. Das UNESCO-Institut für Statistik in Montreal erhebt weltweit Daten zu Bildung und Forschung (vgl. S. 15 ff.). Hingegen konzentriert sich die OECD bei der Datenerhebung auf die Industrieländer als traditionelle

OECD-Mitgliedsländer sowie die BRICS-Staaten. Sie hat seit langem einen Schwerpunkt auf die Entwicklung gemeinsamer internationaler Standards für FuE- und Innovationsstatistiken gelegt (Frascati-Handbuch, Oslo-Handbuch).

Für multilaterale Organisationen bleibt es allerdings eine Herausforderung, die Informationsflut zu den Ländersystemen aufzubereiten und zu publizieren: Diese umfasst u. a. vergleichende Statistiken, Ergebnisse von Kompetenzmessungen sowie Informationen zu Strategien, Instrumenten und Evaluationen. In der Bildung setzt die OECD mit dem *Education Policy Outlook* auf eine neue Flaggschiffpublikation, die alle zwei Jahre erscheinen wird (vgl. S. 17 ff.). In der Wissenschaft gibt es bereits seit längerem einen vergleichbaren Ansatz mit dem *Science, Technology and Innovation (STI) Outlook*. Seit Neuestem ergänzen OECD und Weltbank dies durch den Aufbau einer *Innovation Policy Platform*: Länderspezifische Informationen zu Forschung und Innovation werden zukünftig nach individuellen Abfragen gebündelt in elektronischer Form bereitgestellt (vgl. S. 20 f.).

Politikberatung

Politikberatung durch multilaterale Organisationen und Gremien funktioniert in mehreren Varianten. Zum einen brauchen Staaten Gremien, in denen sie eigenen Analyse- und Beratungsbedarf artikulieren und entsprechende Projekte beschließen können. Vorgestellt wird dazu die Arbeit des OECD *Global Science Forum* über einen Zeitraum von zwei Jahrzehnten (vgl. S. 21 ff.) sowie ein aktuelles Projekt des OECD-Zentrums für Forschung und Innovation in der Bildung (CERI) *Governing Complex Education Systems* (vgl. S. 23 ff.). Thematisch fokussierte Initiativen von multilateralen Organisationen, z. B. zur UN-Weltdekade Bildung für Nachhaltige Entwicklung (vgl. S. 27 f.), zur UNESCO *Engineering Initiative* (vgl. S. 28 f.) und zur Einführung eines internationalen Berufsausweises für Ingenieure (vgl. S. 30 f.) bilden eine weitere Grundlage nationaler Politikberatung.

Wird ein dauerhafter nationaler bzw. internationaler Beratungsbedarf gesehen, kann dies zur Gründung eines neuen Gremiums führen. Mit UNESCO-UNEVOC wurde seit dem Jahr 2000 ein internationales Zentrum für Berufsbildung aufge-

baut, das schwerpunktmäßig Schwellen- und Entwicklungsländer berät (vgl. S. 32 ff.). An der Schnittstelle von Wissenschaft und Politik arbeitet seit 1988 der Weltklimarat IPCC. Als zwischenstaatliches wissenschaftliches Gremium ist es seine Aufgabe, den wissenschaftlichen Sachstand zum Klimawandel in Berichten zusammen zu fassen, die von Delegierten der Mitgliedsländer angenommen werden (vgl. S. 36 ff.). Eine ähnliche Schnittstellenfunktion zwischen Wissenschaft und Politik nimmt der kürzlich gegründete Weltbiodiversitätsrat IPBES wahr.

Multilaterale Organisationen sind aber nicht nur national beratend tätig, sondern haben auch selbst Bedarf an Politikberatung: So verfügt die UNESCO sowohl über ein wissenschaftliches als auch über ein zwischenstaatliches Beratungsgremium zu Fragen der Bioethik (vgl. S. 34 f.). 2012 wurde beschlossen, dass dem UN-Generalsekretär und den Leitern der UN-Organisationen künftig ein wissenschaftlicher Beirat (UN Scientific Advisory Board) zur Seite gestellt wird. Die konstituierende Sitzung findet voraussichtlich Anfang 2014 in Berlin statt.

Koordination und Förderung

Sowohl im Bildungs- als auch im Forschungsbereich legt die EU seit ca. 30 Jahren aus Mitteln des gemeinsamen Haushaltes regelmäßig mehrjährige Förderprogramme auf. Unter den Forschungsrahmenprogrammen wird die Durchführung von FuE durch multilaterale Projektkonsortien seit 1983 durch wettbewerbliche Ausschreibungen gefördert. Angestrebt wird darüber hinaus seit dem Jahr 2000 die Verwirklichung eines Europäischen Forschungsraumes, in dem national geförderte und durchgeführte Forschung innerhalb der EU zunehmend koordiniert und vernetzt wird (vgl. S. 46 f.). Auch im Rahmen der Kohäsionspolitik setzt die EU für die kommende Förderperiode einen spezifischen Fokus auf Forschung und Innovation (vgl. S. 52 ff.).

Auf europäischer Ebene erhält seit Inkrafttreten des Lissabon-Vertrags 2009 die internationale Dimension des Europäischen Forschungsraums (EFR) verstärkte Aufmerksamkeit (vgl. S. 49 ff.). So haben sich in der Forschungs- und auswärtigen Politik die Zuständigkeiten zwischen der Europäischen Kommission, dem neuen Europäischen Auswärtigen Dienst und den Mitgliedstaaten geändert.

Letztere haben über das Strategieforum für internationale Zusammenarbeit in FuE (SFIC) die Möglichkeit, sich an der Ausgestaltung der internationalen Dimension des EFR zu beteiligen (vgl. S. 47 ff.).

In der Förderung hat sich über die EU hinausgehend in den letzten Jahren eine besondere multilaterale Dynamik entwickelt. So könnten unter dem neuen Forschungsprogramm zum globalen Wandel *Future Earth* längerfristig auch multilaterale Ausschreibungen durchgeführt werden (vgl. S. 43 ff.). Britische und US-amerikanische Regierungsstellen haben kürzlich eine *Global Innovation Initiative* lanciert. Ziel ist die Förderung multilateraler Hochschulkonsortien für die Bewältigung bestimmter globaler Herausforderungen mit Brasilien, China, Indien und Indonesien (vgl. *ITB infoservice* 11/2013). Wie der Bericht der Deutschen Forschungsgemeinschaft zeigt, vernetzen sich auch etablierte nationale Förderorganisationen zunehmend, um gemeinsame Ausschreibungen für multilaterale Projektkonsortien durchzuführen (vgl. S. 41 ff.). Seit 2012 wird sogar ein globales Netzwerk nationaler Förderorganisationen (Global Research Council) aufgebaut: Durch die Einigung auf gemeinsame Grundsätze für Förderung und Forschung wird langfristig die Grundlage für gemeinsame Förderaktivitäten verbessert (vgl. S. 38 ff.).

Die Bilanz zeigt: Multilaterale Organisationen nehmen wichtige Aufgaben wie Monitoring und Politikberatung wahr. Im Bereich der multilateralen FuE-Förderung scheint es derzeit für die Schaffung neuer Netzwerke und Initiativen kaum Grenzen zu geben. Gleichzeitig gibt es verschiedene Ansätze innerhalb der EU: Neben der inzwischen schon traditionellen Auflage eines gemeinsamen Förderprogramms sollen sowohl nationale FuE-Förderung als auch bilaterale FuE-Kooperation mit Drittstaaten stärker von den Mitgliedsländern koordiniert werden. Diese Vielfalt von Ansätzen ist zwar grundsätzlich zu begrüßen, angesichts beschränkter nationaler Budgets und drängender globaler Herausforderungen wirft sie aber auch Fragen auf: Welche Ansätze erweisen sich als besonders effektiv und effizient? Wann überwiegen hohe Transaktionskosten einen möglichen Nutzen multilateraler Kooperation und Koordination? Solche Fragen können nur durch vertiefte Analysen und eine breit angelegte Evaluation beantwortet werden. Erste Erkenntnisse zu multilateralen FuE-Kooperationen für die Bewältigung globaler Herausforderungen wurden bereits in einem vom

BMBF angestoßenen OECD-Projekt *Meeting Global Challenges Through Better Governance: International Co-operation in Science, Technology and Innovation* erarbeitet.

Dr. Sonja Bugdahn, Dr. Nadia Klein

Download

OECD Policy Brief (2012) Meeting Global Challenges through Better Governance: International Co-operation in Science, Technology and Innovation

→ <http://www.oecd.org/sti/inno/meeting-global-challenges-policy-brief.pdf>

ITB infoservice 11/13 vom 28.11.2013

→ http://www.kooperation-international.de/fileadmin/public/downloads/itb/info_13_11_28.pdf

Weitere Informationen

OECD Bildung

→ <http://www.oecd.org/education/>

OECD Forschung

→ <http://www.oecd.org/science/>

OECD Innovation

→ <http://www.oecd.org/innovation/>

UNESCO Bildung

→ <http://www.unesco.org/new/en/education/>

UNESCO Naturwissenschaften

→ <http://www.unesco.org/new/en/natural-sciences/>

UNESCO Sozialwissenschaften

→ <http://www.unesco.org/new/en/social-and-human-sciences/>

EU Commission – DG Education and Training

→ http://ec.europa.eu/education/index_en.htm

EU Commission – DG Research and Innovation

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

CERN as a Multilateral R&D Infrastructure: Research Across Borders

CERN, renowned for the discovery of the Higgs boson and the invention of the World Wide Web, is a European research organisation with twenty member states, and a council with scientific and political representatives from each of these member states. There are also a number of international observer states and candidates for new member states. CERN is negotiating member state options with non-European states and, in turn, participating in particle physics projects in other areas of the world. So far, so complex. But that's only the beginning of the story.

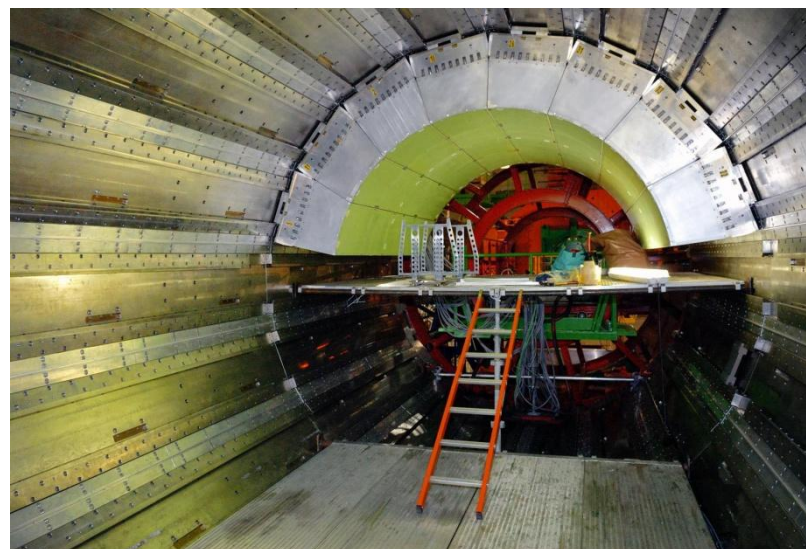
CERN's mission is to provide the international high-energy physics community with the particle accelerators and the infrastructure they need to carry out their research. The flagship accelerator is the Large Hadron Collider (LHC), but there are also many smaller projects that contribute to CERN's research programme. The organization also works with the international experimental collaborations that design, build and operate the big detectors installed at those points along our particle accelerator LHC where the particles collide. And it's these international collaborations that keep CERN at the forefront of research and development.

There is hardly a piece of equipment in the LHC or its detectors that has not been developed and built by an international team consisting of several university institutes from different countries. As there are countless pieces of equipment that are mostly custom-designed – one cannot buy the world's most powerful particle accelerator off the shelf – these collaborations spread through every part

of technology used at CERN. And amazingly it all fits and works together precisely in the end, paving the way to great discoveries like that of the Higgs boson.

Case study: Russian crystals in CMS

Take for example one piece of one of the LHC's four large detectors – the electromagnetic calorimeter of the CMS detector. It measures the energies of particles that fly out from the collisions that occur in the LHC, particularly electrons and photons. It sits roughly in the middle of the 12,500-ton giant CMS.



Half of the CMS ECAL supermodules mounted in the CMS ECAL Barrel; photo: CERN

This particular calorimeter is made up of nearly 80,000 lead tungstate crystals that were especially grown over a period of ten years in factories in Russia and China, checked at CERN and in Italy, recorded in a database developed in France, the UK and CERN, and equipped with photodetectors made in Japan and Russia. The finished products are the sum of contributions made by several hundred people and about 30 institutes. The calorimeter is one of several subdetectors of CMS (a collaboration of over 3,000 people from 42 countries) which all have a similar history. The story of long-term planning, cooperation, precision and many cogs in a big machinery is as extraordinary as it is ordinary – at least for CERN.

Motivated by curiosity

Visiting industry representatives, social scientists and the public at large are fascinated by these individual high-tech high-efficiency collaborations that seem to work almost ad-hoc with hardly any hierarchy. Of course there are memoranda of understanding and there is project management, thorough planning, testing and documentation. Yet this is all done with a grassroots management model that relies – successfully – on the motivation of the participating institutes and individuals.

The common goal to push the boundaries of knowledge and learn more about how the world works is enough to keep projects on schedule and on budget. What is more, religious or cultural differences lose all importance when it comes to designing the most powerful new magnet or high-precision detector chip. Many scientists may be the head of the physics department at their home university, but they all become part of a large collaboration for doing their research. More than 11,000 scientists are involved in the research done at CERN – the majority of particle physicists around the world.

R&D past and future

The story of collaborating across borders in order to develop new technologies for science goes as far back as the beginnings of CERN. It has been a model for particle physics labs around the world, including the German accelerator centre DESY in Hamburg.

Although it is a national lab, its large accelerators and detectors have also been planned and built in large international collaborations. Right now, a new free-electron laser, the European XFEL, is being built there, using an acceleration technology developed in an international collaboration that might also drive the next big project in particle physics in the world, a linear collider to complement the LHC at CERN. In fact, the XFEL is one of eight intergovernmental research organizations in Europe covering fields as diverse as molecular biology and astronomy that have been modelled on the CERN example.

For the next generation of big particle physics projects, a future linear accelerator to complement the LHC, expertise on the various areas of acceleration and detection technology are spread around the world, as are the funds. This means

The CERN convention was signed in 1953 by 12 European founding states and entered into force on 29 September 1954. Today CERN has 20 European member states with special duties and privileges. Observer states and organizations currently involved in CERN programmes include India, Japan, the Russian Federation, Turkey, the USA, the European Commission and UNESCO. Non-member states with co-operation agreements include Brazil, China and South Africa. CERN employs just over 2,400 people, but over 600 institutes and universities around the world use CERN's facilities. Funding agencies from both member and non-member states are responsible for the financing, construction and operation of the experiments on which they collaborate.

that this next-generation accelerator will be a global project right from the start. R&D collaborations are increasingly seeking third-party funding. However, the work is of course not done by scientists and in labs alone; for many procedures industry is taken on board.

Beyond science

Industry is key to successful science. CERN and other research laboratories rely on industry not only to keep facilities running and to ensure a constant supply of the things and services a lab needs to operate successfully. They also challenge industry to come up with new technologies or improved procedures to make operation more smooth, more precise or less expensive. Industry has always been a vital part in the story of accelerator and detector R&D and has helped to push many boundaries, including their own – making them world leaders in competitive markets.

Industry is also often the driver when it comes to taking a step from fundamental science – what CERN is all about – towards our everyday lives. Many of the diagnostic and therapeutic methods used in modern medicine based on particle accelerators or radioactive isotopes may have originated from R&D projects on accelerators or detectors, but in most cases it was the industry involved in these projects that helped the technology transfer from science to application.



Weitere Informationen

CERN

→ <http://home.web.cern.ch/about>

DESY

→ <http://www.desy.de/>

XFEL

→ <http://www.xfel.eu/de/>

The electromagnetic calorimeter of the CMS detector

→ <http://cms.web.cern.ch/news/electromagnetic-calorimeter>

ESA – Die Europäische Raumfahrtagentur

Im Jahr 2014 wird die ESA auf eine 50-jährige erfolgreiche Geschichte zurückblicken können. Eine wesentliche Ursache für die Gründung der ESA war ein Vorfall in den Beziehungen zwischen Europa und den USA: Deutschland und Frankreich hatten Anfang der 1970er Jahre die technisch modernsten kommerziellen Nachrichtensatelliten ihrer Zeit namens „Symphonie“ gebaut. Für den Transport in den Weltraum war man auf die amerikanische Delta-Rakete angewiesen.

Die USA ihrerseits hatten seinerzeit ein Monopol bei Kommunikationssatelliten, das sie schützen wollten. Entgegen anfänglicher US-Zusagen konnte „Symphonie“ erst gestartet werden, nachdem die Europäer zugesichert hatten, „Symphonie“ ausschließlich für experimentelle, nicht aber für operationelle kommerzielle Zwecke zu verwenden.

Dieser Vorgang verstärkte das Bedürfnis nach einem autonomen europäischen Zugang zum Weltraum und führte dazu, dass die neu gegründete ESA als Erstes die Entwicklung einer Rakete beschloss, die unter dem Namen Ariane einer der größten Erfolge europäischer Raumfahrt werden sollte. In der Folgezeit erlebte die ESA einen ungeahnten Aufschwung, weil durch die Raumfahrt die Erforschung der Erdoberfläche, der Atmosphäre und des Kosmos in neue Dimensionen vorstieß. Aber auch zum Nutzen für das tägliche Leben der Menschen spielte die Raumfahrt eine immer stärkere Rolle: Telefonieren, Fernsehen, Wettervorhersagen und Navigation sind in der heutigen Qualität und Präzision ohne Raumfahrt nicht vorstellbar. Hierzu haben die Programme der ESA wichtige Beiträge geliefert.

Gründungsmitglieder der ESA waren zehn Staaten, mittlerweile ist die Zahl auf 20 gestiegen, darunter die Schweiz und Norwegen als Nicht-EU-Staaten; Kanada ist über ein langfristiges Kooperationsabkommen an zahlreichen ESA-

Hauptakteur der deutschen Raumfahrt ist das Deutsche Zentrum für Luft- und Raumfahrt (DLR), eine der führenden Forschungseinrichtungen in Europa in den Bereichen Luftfahrt, Raumfahrt, Verkehr, Energie und Sicherheit. In seiner Rolle als deutsche Raumfahrt-Agentur ist es eine gestaltende Kraft der europäischen Raumfahrt. Das DLR besteht aus 32 Forschungsinstituten und Betriebseinrichtungen mit etwa 7.700 Mitarbeitern an 16 Standorten.

Programmen beteiligt. Aufgabe der ESA ist die Zusammenarbeit europäischer Staaten zu ausschließlich friedlichen Zwecken auf dem Gebiet der Weltraumforschung und -technologie. Große Weltraumprogramme wie die Ariane oder die bemannte Raumfahrt mit der europäischen Beteiligung an der Internationalen Raumstation ISS durch das Columbus-Labormodul und durch Versorgungsflüge mit dem unbemannten Raumtransporter ATV (Automated Transfer Vehicle) können nicht durch einzelne Nationen, sondern nur durch gemeinsame Anstrengungen im europäischen Rahmen durchgeführt werden. Hierfür stellen die Mitgliedstaaten der ESA rund 3 Milliarden Euro zur Verfügung. Hinzu kommt nahezu eine weitere Milliarde Euro von der EU im Wege eines Auftrages für die Entwicklung von Galileo (unabhängiges europäisches Navigationssystem) und GMES/Copernicus (globale Umweltbeobachtung).

Bei der Durchführung ihrer Aktivitäten lässt sich die ESA von Prinzipien leiten, die für den Erfolg der ESA ursächlich sind: die Pflicht- und Fakultativprogramme sowie das Prinzip des industriellen Rückflusses. Das Pflichtprogramm, das die Weltraumforschungsprogramme und das allgemeine Budget umfasst, wird von allen Mitgliedstaaten gemeinsam finanziert. Der anteilmäßige Beitrag der einzelnen Staaten richtet sich nach dem jeweiligen Bruttoinlandsprodukt. Hinsichtlich der optionalen Programme (z. B. Trägerrakete, Erdbeobachtung, Telekommunikation, Internationale Raumstation) ist es hingegen jedem einzelnen Staat freigestellt, ob und in welcher Höhe er sich beteiligt. Diese Flexibilität in Verbindung mit dem Prinzip des industriellen Rückflusses, wonach das in ein Programm eingezahlte Geld wieder in Form von Aufträgen an die Industrie des Mitgliedstaates zurückfließt, stellt einen starken Anreiz für Investitionen in die ESA dar.

Die ESA ist eine von der EU unabhängige internationale Organisation; ihre Entscheidungen beruhen auf zwischenstaatlicher Zusammenarbeit im ESA-Rat und in den Programmräten. Die Zusammenarbeit von 20 europäischen Mitgliedstaaten mit unterschiedlichen national geprägten Vorstellungen stellt für die ESA eine besondere Herausforderung dar. Der Reiz der internationalen Zusammenarbeit beschränkt sich aber nicht nur auf die Beziehungen der ESA-Mitgliedstaaten untereinander. Praktisch alle großen Raumfahrtprojekte sind durch internationale Zusammenarbeit geprägt. Dies gilt insbesondere für das



Satelliten-Navigationssystem Galileo; Foto: ESA

nationalen Ideenwettbewerb die Mission EUCLID zur Erforschung der dunklen Energie des Universums ausgewählt. Umgekehrt öffnen die Raumfahrtagenturen anderer Staaten wie USA, Russland, Japan und auch China ihre eigenen Projekte zur wissenschaftlichen Zusammenarbeit. Grundsätzlich gilt dies auch für die Konzipierung und Nutzung von Erdbeobachtungssatelliten. Die internationale Zusammenarbeit im Bereich der bemannten und robotischen Exploration wird seit 2006 von der *International Space Exploration Coordination Group* koordiniert. Dabei handelt es sich um einen informellen Zusammenschluss führender Raumfahrtorganisationen wie ESA, NASA (USA), Roskosmos (Russland), CNES (Frankreich), DLR (Deutschland), JAXA (Japan) und CNSA (China), die ein Strategiepapier veröffentlicht haben, das die Zielsetzung der friedlichen Exploration des Weltraums beschreibt. In der Internationalen Raumstation ISS, der weltgrößten Zusammenarbeit, die je zu Friedenszeiten unternommen wurde, wird internationale Zusammenarbeit täglich gelebt, insbesondere durch die Astronauten und Kosmonauten in der Station. Weil viele Raumfahrtprojekte aufgrund der technischen Komplexität und der hohen Kosten nur in internationaler Zusammenarbeit zu bewältigen sind, will die Bundesregierung gemäß ihrer Raumfahrtstrategie die arbeitsteilige internationale Zusammenarbeit weiter ausbauen.

Wissenschaftsprogramm der ESA, denn die wissenschaftlichen Satelliten und Raumsonden der ESA werden ausnahmslos in Abstimmung mit der internationalen Wissenschafts-Community entworfen, und am Bau der Sonde und an der Auswertung der Daten sind Wissenschaftler aus aller Welt beteiligt. Zuletzt hat die ESA in einem inter-

Mit dem Vertrag von Lissabon hat die EU eine Rechtsgrundlage für Raumfahrt erhalten. ESA und EU haben schon zuvor auf der Basis eines Kooperationsabkommens zusammengearbeitet. Während sich die ESA als eigenständige zwischenstaatliche Organisation für die Durchführung komplexer und anspruchsvoller Raumfahrtprojekte bewährt hat und als verlässlicher internationaler Partner einen festen Platz eingenommen hat, wird sich die EU um solche Aufgaben kümmern, die komplementär zu den bestehenden Aufgaben der ESA und den Mitgliedstaaten stehen.

Der internationale Charakter der Raumfahrt spiegelt sich auch bei den Mitarbeitern der ESA wider. Hier arbeiten an den Standorten Paris, Noordwijk, Frascati, Villafranca, Harwell, Darmstadt und Köln rund 2.200 Mitarbeiter, die ausschließlich aus den Mitgliedstaaten sowie Kanada rekrutiert wurden. Die Mitarbeiter werden aufgrund ihrer Befähigung ausgewählt, also nicht nach einer vorgegebenen Quote. Es wird aber darauf geachtet, dass die Mitgliedstaaten angemessen repräsentiert sind.

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 Leiter Büro Paris
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 Luft- und Raumfahrt (DLR)
 Paris, Frankreich

Weitere Informationen

European Space Agency

→ <http://www.esa.int/ESA>

Deutsches Zentrum für Luft- und Raumfahrt (DLR)

→ <http://www.dlr.de>

International Energy Agency Implementing Agreements

Deploying science and technology based research requires the opportunities offered by private sector involvement in multilateral co-operation. Multilateral technology initiatives supported by the Implementing Agreement framework of the International Energy Agency facilitate co-operation among member and non-member country governments. These initiatives involve a variety of actors from the public and private sectors to conduct research and implement research findings.

Research and development in the energy industry is capital and labour intensive. In order to pool resources, avoid duplication and share information, International Energy Agency (IEA) Implementing Agreements (IAs) assemble a variety of initiatives on diverse projects ranging from advanced fuel cells to wind energy systems. At present, 40 IAs are in operation.

The private sector is involved in a number of IAs either as a government designated participant (Operating Agent), or as a non-government designated participant (Sponsor). The private sector primarily participates in IAs focussed on fossil fuels or renewable energies. IAs came into being in 1975 and in 1977 the private sector began participating. In 1979, a private sector company (Austrian oil company OMV) was first designated as a government representative.

Effectively governing international co-operation in science, technology and innovation

IEA Implementing Agreements were analysed as part of a broader research project conducted across the sectors of agriculture and food security, health, energy and climate



The IEA was founded in response to the 1973-74 oil crisis

as an autonomous organization within the OECD framework. It works to ensure reliable, affordable and clean energy for its 28 member countries and beyond through a broad range of activities, including the more than 40 Implementing Agreements (IA). The IAs can comprise any technology-related activity such as the filling of research gaps, demonstration and deployment. A new initiative may be created at any time, provided at least two IEA member countries agree to work on it together.

change. This project was carried out with funding from the German Federal Ministry of Education and Research (BMBF) by the Organisation for Economic Co-operation and Development (OECD) in coordination with the German Development Institute (DIE), which contributed research and coordinated the expert group consisting of research institutes, ministerial offices, and international organisations. This resulted in the 2012 OECD publication “Meeting Global Challenges through Better Governance: International Co-operation in Science, Technology and Innovation”.

Five elements of governance formed the basis of analysis for this study: Priority setting, funding and spending arrangements, knowledge sharing and intellectual property, putting science, technology and innovation (STI) into practice, and STI capacity building. Each of these areas present challenges and opportunities for effectively governing international STI co-operation. Of these five governance dimensions, the analysis of private sector involvement in IEA IAs yielded particular lessons in the area of knowledge sharing and intellectual property, putting STI into practice and STI capacity building.

Knowledge sharing and intellectual property

Working on the frontiers of research, IAs seek to provide solutions for global energy supply and demand, improve energy security, and address the global challenge of climate change. Beyond conducting research for use within their own collaboration, IAs contribute to broader IEA processes and other international collaborative efforts, such as the International Thermonuclear Experimental Reactor. The significance of the research conducted entails not only promising opportunities, but also daunting challenges from the perspective of knowledge sharing and intellectual property.

Challenges related to intellectual property rights (IPR) governance arise increasingly as market deployment nears. Private sector participation is noted for bringing know-how to IA collaboration in the form of harmonised IPR frameworks. The decision of treatment of IPRs is left to the individual IAs to formulate and allows for improved tailoring of IPR to suit the nature of the co-operation. As such, the flexibility to re-draft IPR frameworks at various research stages may be implemented as a means of best tailoring IPR guidelines to facilitate co-operation.

Putting STI into practice

In addition to its research and development capabilities, the private sector is a valuable contributor to IAs to facilitate market deployment, tailor research to and anticipate market demands. The research and policy making expertise brought by the participants of academia and government is complemented by the market knowledge, experience and proximity of the private sector. Industry knowledge of benchmarking and standards may also complement that of academia and the public sector.

Many of the private sector participants in IAs are based in, or have operations in IEA non-member countries. This brings further diverse knowledge of growing markets. A variety of enterprises from IEA non-member countries participate in IAs, including partially or fully state owned enterprises, such as Banpu (Thailand) and Bharat Heavy Electrics (India) in the Clean Coal Centre IA and Petrobras (Brazil) in the Greenhouse Gas IA. Multinational enterprises with operations in developing countries are also participants, such as Anglo Coal, Xstrata Coal, Alstom, BG Group, Repsol and Shell.

STI capacity building

The Climate Technology Initiative IA has capacity building as a primary goal. The Private Financing Advisory Network (PFAN), which it hosts, conducts technology needs assessments which provide technical assistance in coordination with multilateral organisations and the private sector. It further connects project developers in emerging countries with potential financiers to support the development of environmentally sound projects. Since its founding in 2006, PFAN has achieved over USD 200 million in project financing and estimates that the resulting installed clean energy supply of 250 MW will cut a total of 1.6 million tonnes of CO₂. It has furthermore connected numerous project developers and private sector actors to deliver advice throughout the business cycle, from business plan preparation to project deployment.

Complex global challenges require a diversity of actors

Conducting joint research and deploying solutions for global challenges such as energy supply and climate change requires a diversity of actors to be successful.

This is important to understand the nature and consequences of global challenges, to assemble depth and breadth of expertise, pool resources, and deploy solutions. Private and public sector actors in IEA IAs demonstrate this mutually beneficial relationship.



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Download

OECD Policy Brief (2012) Meeting Global Challenges through Better Governance: International Co-operation in Science, Technology and Innovation

→ <http://www.oecd.org/sti/inno/meeting-global-challenges-policy-brief.pdf>

Chapter "International Energy Agency Implementing Agreements" in OECD (2012): Meeting Global Challenges Through Better Governance (für OECD iLibrary Abonnennten)

→ http://www.oecd-ilibrary.org/science-and-technology/meeting-global-challenges-through-better-governance/international-energy-agency-implementing-agreements_9789264178700-11-en

Weitere Informationen

International Energy Agency

→ <http://www.iea.org/>

IEA Multilateral Technology Initiatives

→ <http://www.iea.org/topics/cleanenergytechnologies/multilateraltechnologyinitiatives/>

→ <http://www.iea.org/techno/index.asp>

Deutsches Institut für Entwicklungspolitik (DIE)

→ <http://www.die-gdi.de>

The United Nations University Institute for Environment and Human Security

The Institute for Environment and Human Security (UNU-EHS) was established in December 2003 in Bonn, Germany, and started its operations in 2004. It is one of the fifteen institutes and programmes of the United Nations University (UNU), which was founded in 1973 as the academic arm of the UN system. Being a global institution of academic research and education, the central concern of UNU is the generation and dissemination of scientific knowledge as well as strengthening of capacities relevant to promoting human security and development, in particular in developing countries.

UNU-EHS is a high-level research and think-tank institution emphasizing a systems-oriented, interdisciplinary, problem-solving approach in its work and further acts as a think tank for the United Nations and its Member States. It explores problems and promotes solutions related to the environmental and social dimension of human security and aims at academic excellence in two broad thematic areas, namely (a) vulnerability assessment, resilience analysis, risk management and adaptation strategies within linked human-environment systems, including innovative insurance models, and (b) internal displacement and transboundary migration due to environmental push-factors. The institute comprises of four academic programmes: (1) Environmental Migration, Social Vulnerability and Adaptation; (2) Vulnerability Assessment, Risk Management and Adaptive Planning; (3) Environmental Vulnerability and Energy Security; and (4) Enhancing Graduate Educational Capacities for Human Security.

UNU-EHS is engaged in direct supervision of PhD work as well as in provision of support to PhD researchers from around the world in particular through the coordination of the PhD programmes and its support in curriculum development and teaching on Master level. Moreover, UNU-EHS maintains and further develops its strong links with its two main funding ministries, namely the German Federal Ministry for Education and Research (BMBF) and the State Ministry of Innovation, Sciences, Research and Innovation of North Rhine-Westphalia.

The projects of UNU-EHS are being carried out in cooperation with and in support of a range of partners. Major projects include Rainfalls, the Loss and Damage in Vulnerable Countries Initiative, the WorldRiskIndex, and the Master programme on Geography of Environmental Risks and Human Security.



„Where the rain falls“ project: local herder in Paccha, Peru; photo: Andrea Milan, UNU-EHS

The research project “Where the rain falls: climate change, hunger and human mobility” (Rainfalls), is undertaken in partnership between UNU-EHS and CARE International, a humanitarian aid organization. It aims to improve the understanding about how rainfall variability affects food and livelihood security, and how these factors interact with household decisions about mobility/migration among groups of people particularly vulnerable to the im-

pacts of climate change. The Rainfalls project is interested in understanding why people react differently to stress caused by changing weather patterns and food insecurity and explores to what extent changing weather patterns influence people’s migration decisions, as one of the mechanisms used by people experiencing this kind of stress. The project undertakes fieldwork in Latin America, Africa and Asia, and aims at moving methodological approaches for investigating the relationship between climate change variability and climate change, and societal phenomena like migration forward. Related projects on migration have been carried out with the UN High Commissioner for Refugees.

The Loss and Damage in Vulnerable Countries Initiative was initiated by the Government of Bangladesh (GoB) and motivated by the need to understand more about this emerging issue. In order to move forward the debate on loss and damage for the benefit of the least developed countries (LDCs) and other vulnerable countries, the GoB requested assistance from the Climate and Development Knowledge Network (CDKN) to help build a common understanding

around Loss and Damage and provide insight into what it entails for vulnerable countries. CDKN has appointed a consortium of organizations, which includes Germanwatch, UNU-EHS, the International Centre for Climate Change and Development and the Munich Climate Insurance Initiative to carry out this work. The Project has four overall key goals: (1) supporting LDCs in the loss and damage negotiations; (2) engineer the debate; (3) case studies that show loss and damage realities in LDCs; (4) drive national policy responses to loss and damage in Bangladesh. Within the overall project framework, UNU-EHS is responsible to carry out the following research activities: (1) preparation of case studies, research oversight and coordination; (2) fieldwork and data collection; (3) synthesizing main messages from the case studies and provide a policy analysis; and (4) dissemination of results. In the framework of this project, UNU-EHS provides support to UN Framework Convention on Climate Change (UNFCCC) delegates through informal negotiator dialogues, by focusing on the topic of Loss and Damage and also supports UNFCCC in regional expert meetings.

The West African Science Service Center on Climate Change and Adapted Land Use (WASCAL) project is a large-scale research-focused programme, initiated and funded by the BMBF, to develop effective adaptation and mitigation measures to climate change. The geographical focus of WASCAL is on West Africa with in-depth research in case study watersheds in Benin, Burkina Faso and Ghana. WASCAL is based on three principal components: a Competence Center, a core Research Programme and a Graduate Research Programme. The Competence Center will contribute to the development of local research capacity, and serve as a service center for the partner countries, building on the national research communities of the West African countries participating in WASCAL. UNU-EHS is responsible for the research package on Risk Assessment and is co-responsible for curriculum development of teaching in a MSc programme on Climate Change and Human Security to be based at the Université de Lomé, Togo.

The WorldRiskReport, issued annually since 2011, helps to evaluate the vulnerability of societies to natural hazards. On behalf of Alliance Development Works, UNU-EHS has developed the WorldRiskIndex and calculated risk values for 173

countries worldwide. Besides the traditional components of exposure and susceptibility, the WorldRiskIndex takes into account two important additional factors influencing the risk of a population group, namely the coping capacity and the adaptation capacity. The latter is the dominating risk contribution, particularly in contexts of weak institutional structures.

Finally, the Joint Master of Science in the Geography of Environmental Risks and Human Security is offered by UNU-EHS in cooperation with the University of Bonn as an international joint degree programme. The course which has started in autumn 2013 has a research-oriented profile, but with a focus on the application of the research in the context of international institutions and mechanisms. The two-years programme educates students in an interdisciplinary and trans-disciplinary manner on how to investigate and manage various resources related to environmental hazards by implementing science-based principles and methodologies to disaster risk management.



Weitere Informationen

UNU-EHS

→ <http://www.ehs.unu.edu/>

Where the rain falls: climate change, hunger and human mobility

→ <http://wheretherainfalls.org/>

The Loss and Damage in Vulnerable Countries Initiative

→ <http://www.lossanddamage.net/>

The West African Science Service Center on Climate Change and Adapted Land Use (WASCAL)

→ <http://www.wascal.org>

WorldRiskReport

→ <http://www.worldriskreport.com/Bericht.435.0.html?&L=3>

Joint Master of Science in the "Geography of Environmental Risks and Human Security"

→ <http://unu.edu/admissions/affiliated/joint-msc-in-the-geography-of-environmental-risks-and-human-security.html>

Vergleichbare Daten eröffnen neue Perspektiven

Data to Make a Difference – UNESCO Institute for Statistics

The UNESCO Institute for Statistics (UIS) is the only statistical agency to produce internationally comparative data for countries at all stages of development in order to provide a global perspective in the fields of education, science technology and innovation, culture, and communication.

Based in Montreal (Canada), the Institute serves Member States and the UN system, as well as inter- and non-governmental organizations, research institutes, universities and citizens interested in high-quality data. The central goal is to improve the opportunities and living conditions of children and adults around the world by providing the data needed to monitor and benchmark progress towards international development goals.

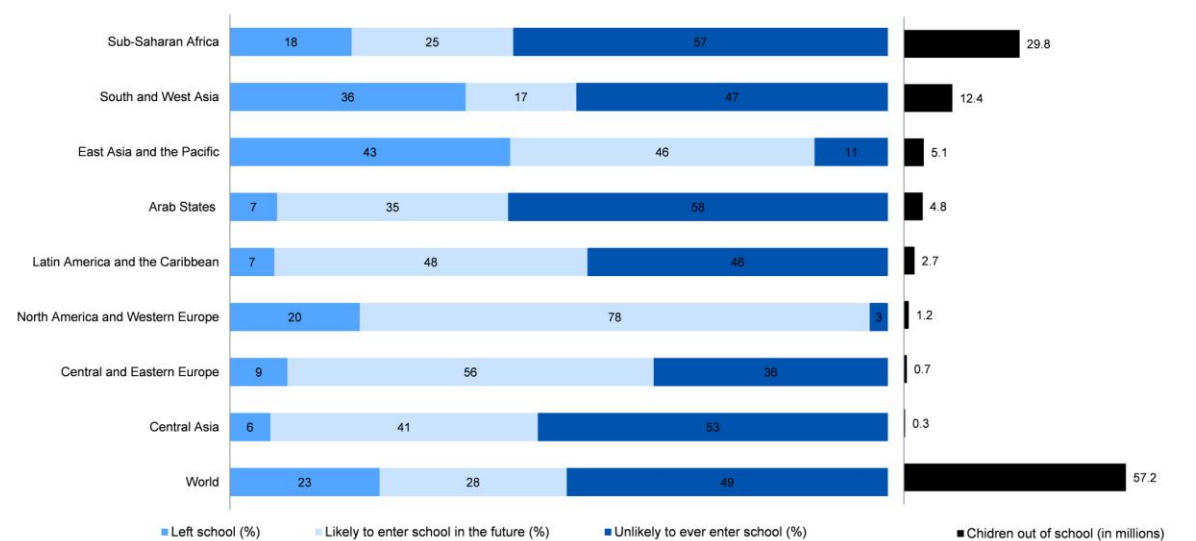
The Institute is the official data source for the education-related targets of the Millennium Development Goals and Education for All (EFA). The data are featured in leading publications and databases, such as EFA Global Monitoring Report, World Development Indicators and World Development Report (World Bank), Human Development Report, UN Development Programme, State of the World's Children (UNICEF) and many others.

The Institute works closely with statisticians in more than 200

countries and territories through its annual education survey in order to build the world's most comprehensive education database. Based on administrative data provided by national statistical agencies, the UIS calculates a wide range of indicators used to monitor trends at global, regional and national levels.

Consider the international community's pledge to achieve universal primary education (UPE) by 2015. According to UIS data, tremendous progress has been made, with the global adjusted primary net enrolment rate rising from 85 % to 91 % between 2000 and 2011. But to reach the UPE goal, countries will have to review and adapt their policies while making the most of limited resources. For example, many countries do not have enough trained teachers in classrooms to provide every child with primary education. So the UIS produces annual projections of the numbers of trained teachers expected to enter and leave the profession as well as the number of new teaching positions needed in each country to achieve UPE by 2015 or beyond. These projections are based on administrative data collected on an annual basis through the Institute's global education survey.

According to UIS data, 57 million children of primary school age are out of school. This is probably the most widely cited UIS figure, used by UN agencies and NGOs as a rallying call for action within the international community. But who are these children and why do they remain excluded? According to UIS data, we know that more than half of the 30 million children who don't go to school in Sub-Saharan Africa will probably never enter a classroom. Another 18 % have started school but dropped out and



School exposure of out-of school children of primary school age by region, 2011; source: UNESCO Institute for Statistics database

25 % are expected to start late (see figure page 15). By using these indicators on school exposure, policymakers can better target their interventions. But clearly more detailed information is necessary. So the UIS and UNICEF are working together to develop new methodologies that use administrative and household survey data to better identify these children in terms of their geographic location, socio-economic status, ethnicity and other key characteristics.

The UIS is also looking ahead to the post-2015 development agenda. In particular, data show that learning levels – rather than years in school – are what drive many social and economic returns on investments in education. But too often children leave school without acquiring the basic knowledge and skills they need to lead productive, healthy lives and to attain sustainable livelihoods. In response, the UIS and the Center for Universal Education at Brookings have joined forces to convene the Learning Metrics Task Force, which aims to catalyze a shift in the global conversation on education from a focus on access to access plus learning. Based on inputs from technical working groups and global consultations, the task force is formulating a series of recommendations to help countries and international organizations measure and improve learning outcomes for children and youth worldwide.

Science, technology and innovation are another major priority for the UIS. In addition to our biennial survey on the human and financial investments in research and development, we have recently launched the world's first global survey of innovation data. Despite the clear demand for this information, very little data is currently available. Only about 100 countries regularly conduct innovation surveys. The United States, for example, released the results of its first innovation survey in 2010.

For the UIS, the first challenge has been to design a survey that could yield internationally comparable data while reflecting the conditions and priorities of countries at all stages of development. So we began by comparing national surveys from different regions. What kinds of information are countries trying to collect? To what extent are they succeeding? This perspective is essential for the UIS to produce policy-relevant data for all countries. On the one hand, the survey items must be extremely precise in order to ensure the cross-national comparability of the resulting data. Yet at the same time, we have to limit the

number of subjects covered in the survey or many countries will not be able to respond. Therefore, we must strike a compromise between the political relevance of the data and the feasibility of collecting them.

To this end, the UIS began by working with regional partners – from Eurostat and the OECD to the Network for Science and Technology Indicators – Ibero-American and Inter-American (RICYT) and the African Union – to adapt existing survey items and methodology used in OECD countries. This close collaboration with regional partners and national statistical offices allowed the UIS to develop a pilot survey which was then tested and refined based on direct feedback from countries around the world.

Thanks to the ongoing support of these partners, the UIS global survey on innovation was launched in July 2013. While preparing to process results, we know that the ongoing challenge will be to improve the response rates of countries. Part of the answer lies in training. By providing national statisticians with ongoing support and training, the UIS and its partners can help them to respond to the survey. And they, in turn, will provide invaluable feedback on how to improve the data collection over time.

Across these diverse fields, the demand for UIS data has never been greater. However, the financial resources devoted to data production appear to be shrinking. So the UIS must strike a careful balance. On the one hand, we must continue to develop new policy-relevant indicators in order to reflect emerging priorities. Yet at the same time, we must maintain the high quality of the entire database, which is a global public good, freely available for use by all. However, this lofty principle loses its veneer if people don't have confidence in the quality.



Weitere Informationen

UNESCO Institute for Statistics (UIS)

→ <http://www.uis.unesco.org>

International Goals

→ <http://www.uis.unesco.org/Education/Pages/education-statistics-mdg.aspx>

Teachers

→ <http://www.uis.unesco.org/Education/Pages/teachers-statistics.aspx>

Video: Reaching out-of-school children

→ <http://www.uis.unesco.org/Education/Pages/reaching-oosc.aspx>

Learning Metrics Task Force

→ <http://www.brookings.edu/about/centers/universal-education/learning-metrics-task-force>

A global perspective on science and technology

→ <http://www.uis.unesco.org/ScienceTechnology/Pages/default.aspx>

The OECD Education Policy Outlook: How Does it Contribute?

The new Education Policy Outlook series, published every two years, is meant to provide a valuable source of comparative analysis and information on policies and reforms for education policy makers across OECD countries. Building on the substantial comparative and sectorial policy knowledge base available within the OECD, it will develop a comparative outlook on education policy by providing (a) analysis of individual countries' educational context, challenges and policies (education policy profiles) and of international trends and (b) comparative insight on policies and reforms on selected topics.

But before reviewing how the Outlook can provide valuable and unique information for policy makers and practitioners, we need to start from the beginning. What is the OECD? The Organisation for Economic Cooperation and Development is an international organisation made up of 34 like-minded countries from Europe, Asia, America and Oceania that come together through the OECD to compare policy experiences, look for answers to common challenges, identify good practices and coordinate domestic and international policies. The OECD Secretariat supports these exchanges by gathering and analysing quantitative and qualitative data and information, monitoring economic development, trade, environment, education, agriculture, technology, taxation and trends, conducting

analysis and providing forecasts. The main objective, as the world evolves, is to promote policies that will improve the economic and social well-being of people around the world.

It is within this remit that education and skills have a large space within the OECD. Our member countries recognise that education is important, and at OECD, we believe that education is an investment in the future of our societies and economies and we target our work to make sure that this investment delivers quality education for all. We look at skills through PISA (Programme for International Student Assessment), and the new International Adult Skills Survey, we analyse how to prepare and equip teachers and school leaders based on data and country evidence, we review how countries are fostering innovation, or how to strengthen vocational education and training. We compare, benchmark and provide the knowledge base for countries to learn from each other. This is how the Education Policy Outlook was born very recently, to contribute to compare, benchmark, and provide an education policy knowledge base for countries and their policy makers.



An Outlook on Education Policy

Across OECD countries, different factors have contributed to raise the importance of education policy and of developing the evidence base to support effective reforms. The starting point is the increased focus on raising student outcomes across countries. "Skills transform lives and drive economies and skills have become the global currency of 21st century economies". Skills affect peoples' lives and the well-being of nations not only in terms of economic growth

and labour market outcomes, but also in terms of social and individual wellbeing. And education is one of the key levers for raising knowledge and skills of our young populations. Ensuring that education and training are of high quality, and that education systems are equitable for all are key levers for improvement.

As the economic crisis continues to push policy makers to allocate scarce resources effectively, policy makers need to have up to date and evidence based analyses to guide them in providing education systems that are performing as well as possible.

At the same time, education systems have more information than ever regarding schooling and policy making. There is increasing information on the results of school systems, with more testing and assessment of students, teachers and schools. The mainstreaming of technologies has also increased the education knowledge base internationally. Greater access and availability of information is contributing to raise awareness across societies regarding school outcomes and raising accountability of education by not only Ministries of Finance, who are looking for an understanding of the effectiveness of educational expenditures but also by parents, politicians and other stakeholders. More information on education has resulted in education being at the centre of national discussions and debates.

To support countries' education policy making, the OECD has been working to develop the knowledge and evidence base across selected education policy topics through surveys, data collection and comparative reviews on selected topics. PISA has provided much knowledge on education and skills attainment of 15 year olds, as well as on the background factors that contribute to develop these skills. It has provided the capacity for much additional research on the factors that contribute to education improvement. The key findings of OECD thematic policy studies can be found in Education Today published every two years. In terms of comparative data, the Indicators of Education Systems programme has been expanding its capacity to provide reliable indicators, and the Network on system level data collections (NESLI) has developed system level data relevant for policy making. The Teaching and Learning International Survey has provided key information on teachers and teaching practices, which will be enhanced in the coming years and shed light on this key policy area. All of this

work is available across different reports and activities of the OECD and often does not allow for a systematic analysis of a specific country education policy.

There is also a growing body of evidence that agrees on the different factors that contribute to education improvement. A number of international reports have reviewed the factors that contribute to quality education. While each of these reports adds its own specific focus to the quest for what make good systems perform as they do, many of them agree on the common core policy levers: teaching and teachers, high standards for all students, the wise use of data to follow student progress, capacity building of those engaged in the education process, the key role of school leadership, supporting disadvantaged students and schools and sound policy making. Many of these reports focus on high performing school systems or the analysis of the variables that make a difference in improving school outcomes. They propose ways to motivate education systems towards high performance, and highlight the importance of taking into account the specificities of governance and context to ensure success. But the evidence base is still ad hoc, and there is no systematic and comparative analysis of education policy trends.

In addition, much evidence highlights the importance of contextual factors to the definition of policies and their implementation. The political or economic situation and the institutional settings of each country and its education system have a strong influence on the way policies are introduced and sustained. This implies that every policy reform can be different because of the system's political structure, social, cultural and economic context. Reforms follow different channels in different political contexts: federal systems will have different dynamics than majoritarian or other parliamentary models.

In fact, education systems extend from local schools and independent universities to national ministries in capitals. The responsibilities of institutions and different levels of government vary from country to country, as does the relative importance and independence of non-public providers. Policy making needs to be aligned to the governance structure and take into account the respective responsibilities of different actors. Federal systems such as Austria, Australia, Canada, Germany or Switzerland may look for different options to steer the system, as states or provinces have responsibility for delivering education, and

therefore require different types of policies or institutional arrangements for their education systems to progress. Because context is key in the process of policy design and implementation, there is no assurance that a specific policy from one country would have similar results in another: results may vary from one education system to another.

What is the Outlook about?

To provide a knowledge base valuable for policy makers to respond to their challenges, taking into consideration context, the Education Policy Outlook is a new OECD publication series which uses OECD's existing knowledge to review education policies and reforms across OECD countries. Specifically, it aims to develop a comparative outlook on education policy with a biennial publication series (first edition in 2014) with the following sections:

Trends: An overview of main trends, focusing on reviewing key policy actions that countries have taken in recent years and a future oriented section that will refer to broader trends most relevant for education such as growing migration or changing demographics; or the use of technology and its impact on the classroom.

Snapshot of country education policy profiles: Country education policy snapshots will present a summary of the context, key issues and reforms to support student progress, institutional development, governance and finances, based on Education Policy Outlook Country Profiles (see below).

Education policy reforms: Focusing on reforms in selected areas, in 2014 it will focus on student assessment, school and system evaluation frameworks and how to take innovative learning environments up to scale and sustain them for the 2014 volume.

In addition, Education Policy Outlook: Country Profiles for each country give an OECD overview of the country's education policy in a comparative format. Each profile reviews the current situation of the country's education system, its challenges and policy responses, according to six dimensions related to improvement:

Students: How to raise outcomes for all in terms of 1) equity and quality and 2) preparing students for the future?

Institutions: How to raise quality through 3) school improvement and 4) evaluation and assessment?

System: How is the system organised to deliver education policy in terms of 5) governance and 6) funding?

Each Policy Profile includes highlights, a review of the key policy areas above in terms of context, challenges and policy responses, spotlights, a statistical annex, an education system structure diagram and a list of main references.

Every six months, four country profiles are published with profiles for Australia, the Czech Republic, Ireland, New Zealand, Chile, Finland, Mexico, Norway and Turkey already published and another four (Denmark, France, Germany and Spain) planned for April 2014.

We hope to bridge a gap, as there has not been before a systematic overview of the types of policies and reforms countries are undertaking to respond to their challenges. And we hope to provide policy makers with valuable information, analysis and links on policy challenges and responses that can serve as food for thought and eventually contribute to strengthen international education policy making focused on improving education and skills of youth.



Weitere Informationen

OECD Directorate for Education and Skills

→ <http://www.oecd.org/edu/>

OECD Policy Outlook

→ <http://www.oecd.org/edu/policyoutlook.htm>

The Innovation Policy Platform

The Organisation for Economic Cooperation and Development (OECD), in partnership with the World Bank, has embarked upon a new joint project to build an Innovation Policy Platform (IPP), a web-based, interactive space that provides access to open-data, learning resources, and opportunities for collective learning on innovation policy.

Innovation is crucial for long-term economic growth in developed, emerging and developing countries. It fosters competitiveness, creates employment, helps reduce inequality, and contributes to sustained and inclusive growth. But growth that is driven by science, technology, and innovation requires the right mix of cross-functional and multidisciplinary policy actions, for example, in education, research, finance, and public procurement. The challenge is to find the policy solutions that work in a given context.

IPP sets out to help policy analysts and practitioners better analyse innovation systems and identify and prioritise good practice solutions. It mobilises a broad range of current knowledge and expertise on the design, implementation, and evaluation of policies that are appropriate to specific country needs and socio-economic conditions. The IPP's goal is to create an easily accessible, living repository of global knowledge and to build sustained "communities of practice" and virtual networks.

The IPP's content is layered to provide various levels of depth and detail to meet the needs of different audiences, with a focus on answering context-specific policy questions. Content is organised by modules that cover the main topics relevant for innovation policy (see figure). It includes existing OECD and World Bank analytical reports and statistics, which often offer in-depth insights and analysis. Access to and analysis of statistics is supported by an interactive visualisation tool that enables users to explore and download data. In addition to existing resources, the IPP includes hundreds of webpages that summarise key issues in innovation policy, and links to the more detailed reports and statistics. These pages are also interlinked, navigating users to related topics of interest. The IPP also features policy briefs and country case studies. The former provide short evidence-based descriptions of policy instruments and policy hot topics

while the latter highlight specific country experiences in tackling common problems. Finally, the IPP includes searchable country profiles that provide users with snapshots of some of the main indicators characterising countries' innovation performance.



The IPP's content is organised by modules; source: OECD

The IPP is expected to find a variety of users with different functional and informational needs, including:

- Policy makers who design and implement innovation policy, allocate resources, and set priorities for long-term development and growth agendas.
- Policy analysts, particularly from government, universities, think tanks and consultancies, who inform policy making through concept development, analysis and advice.

- International organisations who work with countries to improve the design and implementation of innovation policies.
- Non-governmental stakeholders such as NGOs, firms, and entrepreneurs who engage in innovation policy processes.

Advanced search capabilities enable easy access to the most current analytical work and operational know-how from the OECD, the World Bank and other organisations. Guided site navigation aids users in framing their problems and in finding solutions that fit their specific contexts. In 2014, collaborative spaces will be opened that allow users to exchange ideas, ask questions, and share solutions.

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	Michael Keenan Senior Policy Analyst Directorate for Science, Technology and Industry
	Caroline Paunov Economist Directorate for Science, Technology and Industry OECD Paris, France

Weitere Informationen

Innovation Policy Platform (IPP)

→ <http://www.innovationpolicyplatform.org>

OECD Directorate for Science, Technology and Industry

→ <http://www.oecd.org/sti>

World Bank Science, Technology and Innovation

→ <http://go.worldbank.org/QMYMZA7XX0>

Gemeinsam lernen – gemeinsam Stärken entwickeln

The OECD Global Science Forum

For over twenty years, the Organisation for Economic Co-operation and Development has hosted a committee of governmental science policy officials of its member and observer countries.

It began as the Megascience Forum (MSF) in 1992. Its creation was based on necessity: increasingly, big research projects needed to be discussed internationally in a timely manner to ensure a globally-coherent response to recognized scientific priorities, to avoid unnecessary duplication and, when appropriate, to bring together funding and expertise for implementing joint research facilities, networks and programmes. The OECD was chosen as the venue for the Forum because of the organisation's commitment to sustainable economic and social innovation, and its acknowledgement of the vital role of basic and applied research for achieving these goals.

In 1999, a new mandate was adopted by the 30 participating countries. The newly-designated Global Science Forum (GSF) shifted its main focus away from the biggest research projects, to concrete challenges and opportunities in well-defined scientific domains, and also to generic cross-cutting issues that concern the planning, funding and managing of basic research. The GSF has now become a general-purpose inter-governmental science policy committee, able to address issues across the entire spectrum of physical, life, earth and social sciences.

The GSF works in a simple way: topics for specific activities are proposed by national delegations, and are reviewed at general meetings that take place every six months. When a proposal is accepted, interested delegations nominate national experts to collectively carry out the activity with assistance from the Forum's secretariat. Depending on the subject area, meetings, workshops, surveys, consultant studies or other mechanisms may be employed over a period of time that ranges from one to three years. An activity always ends with the drafting of a concise policy-level report that contains a clear description of the

challenge or problem or opportunity that led to the undertaking of the activity, relevant facts and findings and, most importantly, recommendations for actions by governments or by other entities, such as international scientific organisations. All Forum reports are always made available to the public.

On four occasions, the outcome of the GSF's work was the establishment of new international research collaborations that became fully independent of the OECD:

- the Global Biodiversity Information Facility (GBIF),
- the International Neuroinformatics Coordinating Facility (INCF),
- the Global Earthquake Model (GEM),
- Scientific Collections International (SciColl).

Since 1992, more than fifty activities have been carried out in this way. To provide a good notion of the range diversity of the GSF's work, the following are activities that are currently under way, or were completed in only the last 24 months:

- Promoting international collaboration and coordination of scientific research collections.
- Modelling of urban systems to address the challenges of climate change and biodiversity.
- Fostering the development and utilisation of data infrastructures for the social sciences.
- Global modelling of natural hazard risks.
- Opportunities, challenges and good practices in international research cooperation between developed and developing countries.
- International cooperation in astroparticle physics.
- Establishing and operating international distributed research infrastructures.
- Facilitating international cooperation on non-commercial clinical trials.

- Scoping a network for temperate agriculture research.
- Optimising scientific advice for governments.
- Case studies of the economic and societal impacts of large research infrastructures.

Throughout its twenty-two year history, the work of the MSF and GSF has been based on two fundamental principles:

Transparency and outreach to scientific communities. The member countries recognise that scientists initiate research projects via a "bottom-up" process, and while the Forum has always been an essentially inter-governmental body, scientists, scientific organisations, and major research institutions have routinely been invited to fully participate in the subsidiary activities, including the formulation of final findings and action recommendations. Thus, for example, when the GSF convened the Working Group on Astroparticle Physics, representatives of CERN and of PaNAGIC (the Particle and Nuclear Astrophysics and Gravitation International Committee of the International Union of Pure and Applied Physics, IUPAP) took part in all of the deliberations and in the preparation of final findings and recommendations. Indeed, the international physics community has often been involved in the work of the GSF. Three of IUPAP's standing Working Groups were created in part as a result of OECD recommendations: the International Committee on Ultrahigh Intensity Lasers, International Cooperation in Nuclear Physics, and the Astroparticle Physics International Committee.

Efficiency and responsiveness. When OECD countries created the Megascience Forum in 1992, one of their requirements was to avoid creating a large international bureaucracy. They wanted a lean, efficient, cost-effective operation, that would serve them and would not, under any circumstances, insert itself, and its own institutional interests, into the substantive work of the committee. Accordingly, they agreed on a budget that would support a minimal secretariat: three full-time international civil servants (one of whom is a secretary/administrator) based at OECD headquarters in Paris. Two members of the secretariat have scientific backgrounds (high-energy physics and molecular biology) but they are not expected to have expert knowledge in the highly diverse topics that the

Forum takes up. They play an enabling and facilitating role, so that substantive work is performed by experts designated by national delegations – chiefly senior programme managers of science funding agencies, and prominent scientists invited by the Forum. Operating this way, 6-8 activities are typically on-going in parallel.

The current five-year mandate of the GSF will expire at the end of 2014. Discussions are already under way on whether the work should continue beyond that date, possibly with a revised mandate or new operating procedures. To support that decision, an evaluation exercise will begin soon.



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Weitere Informationen

Global Science Forum (GSF)

→ <http://www.oecd.org/sti/gsf>

Global Biodiversity Information Facility (GBIF)

→ <http://www.gbif.de/>

International Neuroinformatics Coordinating Facility (INCF)

→ <http://www.incf.org/>

Global Earthquake Model (GEM)

→ <http://www.globalquakemodel.org/>

Scientific Collections International (SciColl)

→ <http://www.scicoll.org/>

OECD Project on Governing Complex Education Systems

One of the most crucial questions for OECD countries today is how to achieve national objectives for education systems under the condition of complexity. The Governing Complex Education Systems (GCES) project is designed to bring together what we know about governing complex systems, to map the current practices of countries and to propose strategies to provide policy makers with key insights and lessons.

Complexity in education systems is on the rise because of a number of intersecting trends. Parents in OECD countries have become more diverse, more individualistic, more highly educated and more demanding, pushing schools to cater more for the individual needs of their children. This has meant that there is a push for schools to respond to local demands. Partly in response to this, governments in almost all OECD countries have increased school autonomy and stimulated demand sensitivity and sometimes competition. The combination of these new governance regimes with increasingly individualised, informed and demanding populations means that complexity and the importance of diverse local contexts can only be expected to increase further.

To a greater or lesser extent these developments have been taking place in all OECD countries in the past three decades. Of course different countries have started at different points of departure. Federal states, for example, have the added



The OECD's Centre for Educational Research and Education (CERI) launched the Governing Complex Education Systems in March 2011. The first phase of the project (2011-2012) built an analytical and conceptual framework as well as beginning case study work with countries. The second phase (2013-2014) continues to help policy makers and researchers understand 21st century governance and how it is intertwined with trends in education. In addition to looking through the explorative lens of governance levels (central, local, multi-level), the second phase will offer a more focused agenda by looking in more depth at the three key issues identified within the project network as the biggest challenges in the field: accountability, capacity building and trust. A main publication at the end of 2014 will present synthesised findings from all output strands of the project.

complexity of authority spread over national and state levels (e.g. Australia, Austria, Canada, Germany or the United States). Certain countries have a long tradition of strong decentralisation (e.g. Finland, the United Kingdom). Other countries have a long tradition of freedom of school choice and of the establishment of (publicly funded, private) schools (like Belgium or the Netherlands). These different points of departure add another layer of complexity that needs to be taken into account when doing international comparative research.

The search for effective governance models in education

Whatever the precise structure of their education systems, many OECD countries have been searching for governance models that allow them to effectively steer complex education systems. This search has led to a multiplication of governance mechanisms that are often applied simultaneously. For example, ministries act as regulator for the education system, setting the rules within which increasingly autonomous schools must operate. But ministries also act as top-down enforcers of quality standards if schools consistently fail to meet these standards. Crucially, ministries are no longer the only actor involved in governing education systems. Apart from the increased role for schools themselves, there is a host of other stakeholders (including buffer organisations, teacher unions, other ministries and national boards) that play a role. When it comes to national strategy setting, negotiation and dialogue have become important governance mechanisms. On the one hand, this multiplication of governance models is a response to underlying complexity; on the other hand, this development further contributes to the complexity of the system.

While decentralisation and the introduction of new governance mechanisms is an understandable and probably necessary response to complexity, ministries of education remain responsible for ensuring high quality, efficient, equitable and innovative education at the national level. In fact, current policy imperatives, like the increasing importance that is attached to education for building a strong knowledge economy and the international comparisons as, for example, provided by PISA and the Trends in International Mathematics and Science Study, increase the importance of national (and international) co-ordination and convergence.

Two main research questions

This is a serious challenge for central governments across the OECD. Governing effectively under these circumstances requires governance models where the need to be responsive to complexity is balanced by the need to ensure national objectives. Therefore, the first key question the project focuses on is:

What models of governance are effective in complex education systems?

Governance systems that can handle complexity will create the conditions for successful education systems. An important element of such systems is their capacity to learn and analyse data. With the growth in complexity, governance has become a knowledge intensive activity, the success of which depends critically on the ability to learn by the institutions involved. In complex and often fragmented systems, sharing knowledge between different parts of the system is essential, for example, to make innovative practice at decentralised levels available in other (decentralised) parts of the system. Knowledge and learning are also essential elements in negotiations and dialogue that are essential to creating consensus in complex systems. Knowledge becomes a tool to steer the system: providing decentralised decision makers and practitioners with relevant, high quality knowledge is imperative to improve the quality of decision making and practices.

The key role of knowledge becomes more important as the different types of testing and assessment on national and international levels have led to an explosion in the kinds and types of evidence available to policy makers. Of course, knowledge is also generated by professional experience and includes tacit knowledge transmitted informally within systems.

For the policy maker tasked with developing a response to a particular issue, it is often not fully clear what kinds of evidence are needed in order to address key policy issues – and in fact there may be multiple paths to a particular evidence-based solution. Policy makers must build a repertoire of actions and strategies to navigate the knowledge options available. Apart from the use of knowledge by policy makers, important questions are how and where knowledge is produced and how it is transmitted to policy makers. In this context, the role of brokerage

agencies in providing timely evidence and helping weigh the various options available is becoming increasingly important. This raises the second key question for the GCES project:

What knowledge system is necessary to support the effective governance of complex education systems?

Central goals of the project

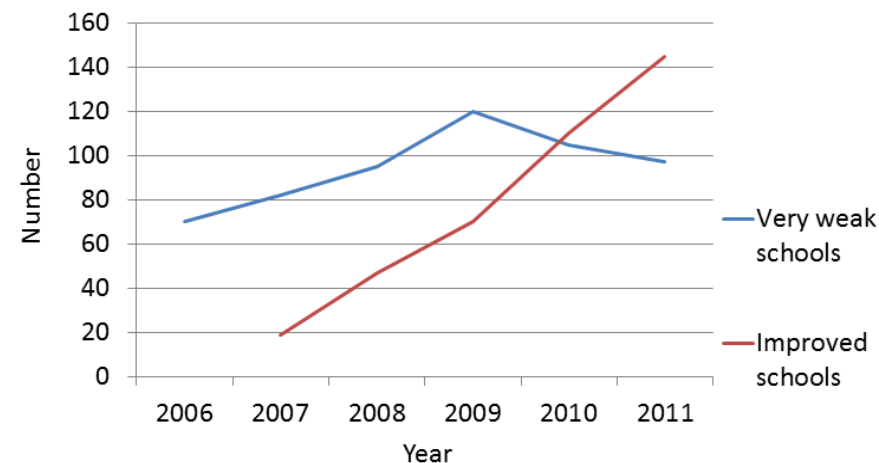
In order to pursue this research agenda, the first phase of the GCES project (2011-2012) had the following three goals:

- Establish the state of research and evidence in governance of education systems and use of knowledge and contribute to the analytical and conceptual knowledge base in the field.
- Explore current practices in OECD member countries through a series of thematic workshops, working papers, and case studies.
- Build an international network of policy makers and researchers with expertise in this area.

To this end, the project produced a range of background and working papers outlining conceptual issues. It began work on case studies, identifying cases relevant to the research questions and collecting the first empirical data. Three case studies on the Netherlands (see figure and link under Download), Norway, and Poland have been finalised so far. In fall 2013, the second strand of case studies has started with an analysis on an educational policy reform in Germany, and other countries will be added throughout the next biennium.

The project also organised a series of thematic conferences and expert meetings to build an international network and bring together relevant stakeholders from policy, research, and practice. The first, Effective Governance from the Centre (The Hague, 21-22 November 2011) looked at the role, responsibilities, and requirements of central government. The second, Effective Governance on the Local Level, (Warsaw, 16-17 April 2012) focused on the role of local government and schools in the governance process and how capacity to govern in an accountable manner could be maintained. The third, Effective Multilevel Governance in Education (Paris, 17-18 June 2013) looked at the interactions of

the various governance levels in education systems. Throughout these discussions and activities three key themes emerged from this first phase: accountability, capacity building, and trust.



Decreased number of very weak schools in the Netherlands (blue line). In 2009, the Dutch Ministry of Education enabled the school inspectorate to label schools that showed low performance on a number of output indicators as “very weak”, with a subsequent action plan for improvement. After the implementation of the reform, the number of very weak schools decreased from 120 to less than 100. This result is part of the GCES Case Study on the Netherlands (for link to original publication, see Download).

Key GCES themes: accountability, capacity building, and trust

The issue of accountability is central to the governance of complex education systems, specifically in terms of setting priorities and steering in multilevel systems with sometimes overlapping actors. Accountability gaps, for example situations where the central level may no longer be the driving force for accountability purposes but there is not a clear or functioning replacement, are one of the challenges that many countries face. A recent GCES Working Paper “Looking Beyond the Numbers: Stakeholders and Multiple School Accountability” (Hooge et al., 2012, see link under Download) argues that vertical measures of accountability, that is, regulatory and school performance accountability, can be usefully augmented by horizontal measures involving multiple stakeholders. These would include actors such as parents, students, and communities. Systems of multiple

school accountability aim to efficiently and effectively take into account the nuanced nature and purposes of education.

As education systems must increasingly respond to new societal, economic and individual needs, it is arguably the local level that is most challenged by these developments. A key element of successful policy reform implementation is ensuring that local stakeholders have sufficient capacity to meet this challenge. In particular, they need adequate knowledge of educational policy goals and consequences, and they need the tools to implement them as planned. Without these, the best policy reform risks being derailed at the level where it counts most: the classroom. It is at this level that education policies must be implemented, and it is here that they either succeed or fail. It is useful to take an overview of capacity building of local level actors and illustrate possible interactions among the various system levels.

Trust is an underlying element that manifests itself in different ways across different contexts. In Finland, for example, the trust in teachers is so strong that school inspections do not even take place – instead, the system functions by trusting in a high level of professionalism and professional ethics of teachers and school leaders. In many other countries, school inspections are a tool of quality control that may or may not indicate a lack of trust, and trust in school actors (for example) is manifested in autonomy in curriculum design and planning.

Continuing work on education governance

The second phase of GCES (2013-2014) continues to address these key issues in a number of different ways and through different audiences. These include: further meetings (peer learning events for countries, annual conferences), working papers, a second strand on case studies, a policy brief series and further publications, e.g. volumes synthesising the findings from the conceptual project work as well as the empirical data collected.

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Download

GCES Working Paper: "Exploring the complex interaction between governance and knowledge in education"

→ <http://dx.doi.org/10.1787/5k9flcx2l340-en>

GCES Working Paper: "Looking beyond the numbers"

→ <http://dx.doi.org/10.1787/5k91dl7ct6q6-en>

GCES Case Study on the Netherlands: "Coping with very weak primary schools"

→ <http://www.oecd.org/edu/cei/Dutch%20GCES%20case%20study%20OECD%20FINAL.pdf>

Weitere Informationen

GCES Project Website

→ <http://www.oecd.org/edu/cei/gces>

Centre for Educational Research and Innovation (CERI)

→ <http://www.oecd.org/edu/cei/>

OECD Directorate for Education and Skills (EDU)

→ <http://www.oecd.org/edu/>

Learning Today for a Sustainable Future: Education for Sustainable Development Beyond 2014

Through the UN Decade of Education for Sustainable Development (DESD, 2005-2014), UNESCO and its partners have promoted education that provides everyone with the opportunities to acquire the knowledge, skills and values needed to contribute to sustainable development.

Education for Sustainable Development (ESD) requires the integration of sustainable-development related issues, such as climate change, biodiversity or poverty reduction, into teaching and learning. It also requires participatory teaching and learning methods that empower learners to become responsible global citizens and contribute to sustainable development.

The World Conference on ESD from 10-12 November 2014 in Aichi-Nagoya, Japan, concluded the UN Decade. It celebrated and assessed the myriads of projects that have taken place all across the world in the last ten years. ESD activities include the revision of curricula, school-based projects that reorient the whole school life towards sustainable development, and non-governmental organizations that organize community-wide learning processes at the local level. ESD has clearly and considerably gained momentum throughout the UN Decade. At the UN Conference on Sustainable Development in Rio de Janeiro, Brazil, in 2012 (Rio+20), countries concluded that ESD should continue and be strengthened after the end of the DESD.

The increased interest in ESD ties in with a wider development in education discourse that has become apparent in the consultations towards the post-2015 agenda. There appears to be a clear trend towards recognizing that education needs to provide learners with the competencies that are relevant for today's world, competencies that go far beyond basic skills. Quality education needs to be education that is relevant in today's complex and interconnected world. That the UN Secretary-General has recently selected the promotion of global citizenship as one of the three priorities of his Global Education First Initiative is a pertinent example for this trend.

The World Conference in 2014 is also expected to launch the future framework for ESD activities after the end of the UN Decade. In late 2012 and early 2013, UNESCO has conducted extensive consultations to explore with governments and other stakeholders the priorities for ESD after 2014. The consultations identified a large amount of successful projects all across the world, but also concluded that much more needs to be done to scale up ESD and ensure that sustainable development is properly integrated across all areas of education. The current proposal for a Global Action Programme on ESD, which UNESCO Member States endorsed in autumn of 2013 and the UN General Assembly will consider in 2014, proposes five priority action areas for ESD activities after the end of the UN Decade.

Advancing policy. An enabling policy environment at the global, regional and national level is crucial for the implementation of ESD. This first action area includes integrating ESD across all relevant education policies. It also includes, and this is an area that may not have received sufficient attention so far, integrating education into all sustainable-development related policies, such as country-level frameworks to address climate change.

Transforming learning and training environments. The second action area focuses on sustainable learning environments such as eco-schools that allow teachers and students alike to integrate sustainability principles in their daily practice. Activities in this area can include supporting education institutions at any level from early childhood through higher education to promote "whole-institution approaches" to ESD, including the development of green campus facilities and of a school sustainability plan.

Building capacity of educators and trainers. The third action area targets educators, who are perhaps the most important lever to enable educational change. Action under this area includes integrating ESD into pre-service and in-service teacher education.

Empowering and mobilizing youth. The fourth action area focuses on youth, the most dynamic and effective group to mobilize the action for the real and lasting change that is required to shape the future. Activities in this area of the proposed

Global Action Programme include designing learner-centred opportunities in ESD for youth, for example, through e-learning and mobile learning.

Accelerating sustainable solutions at local level. The fifth proposed action area focuses on the local level. ESD has a special relevance here because it can translate the global agenda into local action. Activities that should be generated under this area include the provision of ESD by local authorities and municipalities.

All stakeholders from governments to individual education and training institutions will be called upon to develop activities under these five action areas. In fact, implementing the Global Action Programme will depend very decisively on strong partnerships. UNESCO is therefore planning to identify key partners for each of the five priority action areas, which would help advocate for and coordinate relevant activities, implement major activities, report on implementation, and help mobilize resources for the Global Action Programme.

UNESCO is confident that together with a number of strong and dedicated partners it will be able to generate action across the world that makes education truly responsive to sustainable development. Preparing and empowering learners for the challenges of sustainable development has never been more relevant indeed.



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Weitere Informationen

Decade of Education for Sustainable Development

→ <http://www.desd.org/>

World Conference on Education for Sustainable Development

→ <http://www.unesco.org/new/en/unesco-world-conference-on-esd-2014/>

Quality Engineering for Sustainability – Deutscher Beitrag zur UNESCO Engineering Initiative

Im November 2011 hat die UNESCO-Generalkonferenz eine von Deutschland eingebrachte Resolution zur stärkeren Ausrichtung der Ingenieurausbildung am Leitbild der Nachhaltigkeit sowie zur Intensivierung der internationalen Kooperation verabschiedet – die UNESCO Engineering Initiative. Die Mitgliedstaaten der UNESCO, deren Hochschulen und Ingenieurverbände sind eingeladen, sich an der Initiative zu beteiligen. Das übergeordnete Ziel der Initiative ist eine verstärkte Ausrichtung der weltweiten Ingenieurausbildung an nachhaltiger Entwicklung und dem globalen Wandel. Die Initiative wirbt für die Zusammenarbeit zwischen verschiedenen gesellschaftlichen Ebenen, der Wirtschaft, NGOs sowie Bildungseinrichtungen.

Neben Deutschland positionieren sich auch andere Staaten und Ingenieurverbände: China und Dänemark haben bei der UNESCO die Schirmherrschaft für zwei führende Ingenieurausbildungsstätten beantragt. Zusammen mit dem *Institute of Electrical and Electronics Engineers*, der *World Federation of Engineering Organisations* und der *American Society of Mechanical Engineers* arbeitet die UNESCO an neuen Akkreditierungsstandards. Drei UNESCO-Lehrstühle in den Ingenieurwissenschaften entstehen gerade in Israel, Südkorea und Uruguay. Kooperationen wurden eingeleitet mit Intel, Microsoft und Airbus: Im Juni fand in Paris die erste Preisverleihung des „Fly your Ideas“-Wettbewerbs für Ingenieurstudenten statt.

Der Verein Deutscher Ingenieure (VDI) hat zusammen mit der Deutschen UNESCO Kommission (DUK) diese Impulse aufgegriffen und einen deutschen Beitrag zur UNESCO Engineering Initiative entwickelt. Im Juni 2012 kamen auf Einladung von VDI und DUK hochrangige Vertreter von global agierenden deutschen Unternehmen sowie der neun renommiertesten Technischen Hochschulen in Deutschland (TU9), zusammen, um über Initiativen zur Stärkung der Ingenieurausbildung und Weiterbildung insbesondere in Schwellen- und Entwicklungsländern zu beraten. Dieser erste Austausch legte den Grundstein für ein

deutsches Engagement unter der Koordinierung von VDI, DUK und TU9 und mit den Unternehmen Bayer AG, Robert Bosch GmbH, E.ON SE, TÜV Rheinland AG und Volkswagen AG unter dem Titel *Quality Engineering for Sustainability*. Im Februar 2013 stellten diese Partner in Berlin ein Maßnahmenpaket zur Verbesserung der Ingenieurausbildung in Schwellen- und Entwicklungsländern vor.

Dem Engagement der Partner liegt die international beispielgebende Ausbildung der Ingenieure in Deutschland sowie die hohe Produktqualität deutscher Ingenieurskunst zugrunde. Das Ziel der Partner ist es, Qualitätsstandards der deutschen Ingenieurausbildung wie Technologie- und Problemlösungskompetenz, Innovationsfähigkeit, starke Anwendungsorientierung und ausgeprägten Praxisbezug in der Ausbildung in Entwicklungs- und Schwellenländern zu verankern und damit die Qualität der Ingenieurausbildung in diesen Ländern zu verbessern. Daraus soll eine verbesserte Beschäftigungsfähigkeit der Absolventinnen und Absolventen der Ingenieurwissenschaften vor Ort resultieren, womit sowohl der ökonomischen

Die Grundidee der Partnerschaft *Quality Engineering for Sustainability* besteht darin, die Zusammenarbeit deutscher Technischer Universitäten mit Partneruniversitäten in ausgewählten Entwicklungs- und Schwellenländern um eine Zusammenarbeit mit den deutschen Partnerunternehmen und ihren Standorten in den jeweiligen Ländern zu erweitern. Als erste Zielländer wurden Argentinien, Brasilien, China, Indien, Mexiko, Thailand und Vietnam ausgewählt. Weitere Zielländer können folgen; derzeit laufen auch Gespräche mit dem Deutschen Akademischen Austauschdienst über eine formale Zusammenarbeit. Ein von den Partnern entwickeltes Aktivitätsportfolio sieht ein Angebot an Praktikumsplätzen, Diplomarbeiten, Gastdozenturen oder Forschungsaufträgen vor. Das Angebot richtet sich vornehmlich an Studierende in den Zielländern sowie an akademisches Lehrpersonal. Auch mit deutschen Auslandsschulen und anderen internationalen Schulen soll kooperiert werden. Das Modell sieht vor, sowohl bestehende Initiativen zu bündeln und aufzuarbeiten als auch neue Projekte anzustoßen. Durch die Interaktionen zwischen Schulen, Universitäten und Unternehmen im Rahmen dieser Aktivitäten soll sich ein langfristiges und tragfähiges Geflecht von Kooperationsbeziehungen entwickeln, das fortlaufend ausgebaut werden kann. Ziel ist ein Netzwerk, das einen Erfahrungsaustausch zwischen Hochschulen ermöglicht, zwischen Studierenden untereinander im Hinblick auf Karriereperspektiven sowie zwischen Unternehmen bezüglich Rekrutierungsmaßnahmen und -methoden in den Zielländern.

Entwicklung dieser Länder als auch den Unternehmen gedient ist, die dort produzieren. Das von den Partnern entwickelte Maßnahmenbündel und daraus resultierende Kooperationen sind darauf ausgelegt, die Ingenieurausbildung weltweit zu modernisieren und zu stärken.

Aktuell sind erste Kooperationsprojekte in Vorbereitung, zudem laufen derzeit Gespräche über weitere Beiträge aus Deutschland zu der *UNESCO Engineering Initiative*.



Dr. Lutz Möller
Leiter Fachbereich
Wissenschaft, Menschenrechte
Deutsche UNESCO
Kommission e.V.
Bonn



Dirk Manske
Leiter Politik und allgemeine
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VDI e.V.
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Weitere Informationen

Deutsche UNESCO-Kommission e. V.

→ <http://www.unesco.de/home.html>

UNESCO Engineering Initiative

→ <http://www.unesco.de/ingenieurwissenschaften.html>

→ <http://www.vdi.de/artikel/staerkung-der-ingenieurausbildung-weltweit/>

The Engineering Card – A European Professional Card for Engineers

The European Union is dedicated to removing existing obstacles when changing jobs between Member States and promoting professional mobility. To achieve this, the process for recognizing professional qualifications must be significantly sped up and simplified, in particular for engineers. The Engineering card, a professional card for engineers, can make a decisive contribution to this process. It documents educational and professional qualifications according to internationally recognized standards.

As a result, the Engineering card also improves transparency on the European job market for engineers, thereby making it easier for companies to select suitable qualified employees from abroad. The European Federation of National Engineering Associations (FEANI) is calling on the political world to establish a suitable framework for the Europe-wide implementation of the Engineering card in the revision of the EU Professional Qualifications Directive, thereby contributing significantly to the urgently needed simplification of the recognition of qualifications and the facilitation of the mobility of engineers.

With the speed of globalization, the importance of international mobility is increasing for engineers. Industrial enterprises are taking an increasingly active role on foreign markets. Engineering service providers and engineering offices are also becoming increasingly involved in international projects. This increases the demand for engineers who can be deployed flexibly on an international basis. For engineers, the trend towards cross-border mobility presents new challenges. It is becoming increasingly important to acquire initial practical experience abroad in the early stages of one's career, thereby qualifying oneself for employment in international firms and on international projects.

Cross-border recognition of professional qualifications

Despite the obvious increase in demand for internationally mobile engineers, there remain considerable obstacles to mobility even within the EU, in the form of complicated processes for recognizing professional and educational qualifica-

tions. It is still very expensive for engineers to have qualifications obtained in one Member State, recognized in another. The lengthy and costly recognition procedures therefore make it more difficult for engineers to exercise the fundamental European rights of the free movement of workers and the freedom to provide services.

EU Professional Qualifications Directive and professional cards

The European Professional Qualifications Directive from 2005 (2005/36/EC) is designed to remove these obstacles when recognizing professional and educational qualifications. The aim of the revision of the Directive has been to make it much easier to take up and exercise professional activities within the EU. The introduction of a professional card for those professions who are mobile and who wish to have it is a new element. Because of the highly heterogeneous country-specific requirements placed on professional qualifications, automatic recognition and the creation of a common platform were not an option for engineers. The professional card appears to be the only promising way to facilitate the recognition of professional and educational qualifications. It means qualifications are reliably tested and clearly documented by competent bodies. The professional card therefore provides those organizations responsible for recognition in the EU Member States with crucial aid in searching for information and making decisions and as a result can make the recognition process considerably simpler.



FEANI is a federation of professional engineers that unites national engineering associations from 32 European countries. Thus, FEANI represents the interests of over 3,5 million professional engineers in Europe. FEANI is striving for a single voice for the engineering profession in Europe and wants to affirm and develop the professional identity of engineers. Through its activities and services, especially with the attribution of the EUR ING professional title, FEANI aims to facilitate the mutual recognition of engineering qualifications in Europe and to strengthen the position, role and responsibility of engineers in society. The General Secretariat of FEANI, managing the activities of the federation, is located in Brussels since late 1997.



Front and back of the Engineering card; source: VDI

Engineering card: purpose and objectives

The Engineering card is characterized by the following five features, which are key to the success and its acceptance as a professional card:

Completeness: the information contained on the card is comprehensive, i.e. it provides a complete overview of the academic education, professional experience and further training of the card holder.

Standardization based on European standards: the professional card provides information according to the European standards defined under the European Qualification Framework. The EUR-ACE criteria, the accreditation criteria for engineering studies adopted across Europe, also apply to academic education.

Independent testing and recognition: the information on the professional card is reliable. The qualifications are tested and recognized in the country of origin by an independent register commission. The register commission is made up of experts from universities, relevant engineers' organizations and industry. This ensures that the Engineering card is widely recognized.

Flexibility through decentralized administration: The professional card is introduced and administered decentrally, i.e. in each individual EU Member State. This means that qualifications obtained in the card holder's country of origin are documented. In addition to the standardized entries, country-specific additions in line with national requirements are also possible.

Voluntariness: possession of the Engineering card is voluntary. This ensures that the Engineering card offers a needs-based solution and that unnecessary costs and bureaucracy are avoided.

Engineers' organizations from 32 European countries that are members of FEANI are convinced that the Engineering card can make a significant contribution towards facilitating the cross-border recognition of engineers in Europe. Eleven FEANI members have already introduced the concept of the Engineering card in their countries (Germany, Poland, the Czech Republic, Slovenia, Portugal, FYRO Macedonia, Croatia, Serbia, Ireland, Netherlands and Luxembourg).

As a European professional card for engineers, the Engineering card can make a significant contribution to simplifying the cross-border employment and mobility of engineers within the EU.

By creating a suitable framework for the Europe-wide implementation of the Engineering card in connection with the revised EU Professional Qualifications Directive, a significant and urgently needed contribution would be made towards a simpler recognition of qualifications and towards facilitating the mobility of engineers.



Dirk Bochar
Secretary General
FEANI
Brussels, Belgium

Weitere Informationen

FEANI – The European Federation of National Engineering Associations

→ <http://www.feani.org>

engineerING card

→ <http://www.engineering-card.de/>

European Professional Qualifications Directive from 2005 in practice (2005/36/EC)

→ http://ec.europa.eu/internal_market/qualifications/directive_in_practice/

UNESCO and the UNESCO-UNEVOC International Centre

UNESCO had long realized the importance of education for the world of work. The UNESCO-UNEVOC International Centre is a specialized agency of UNESCO for Technical and Vocational Education and Training (TVET) and was established in Germany in 2000 on the basis of the recommendation of the Second International Congress on TVET. Through the UNEVOC International Centre, UNESCO contributes to human, social and economic development through the promotion of learning for the world of work and life.

UNESCO-UNEVOC plays a crucial role within the integrated delivery of UNESCO's TVET programme and provides international leadership and coordination of the UNEVOC Network in member states. In doing so, UNEVOC exercises its three core functions which are (a) provision for upstream policy advice and related capacity building, (b) clarification of the concept of skill development and improvement of monitoring, and (c) clearinghouse-related actions and informing about the global debate.

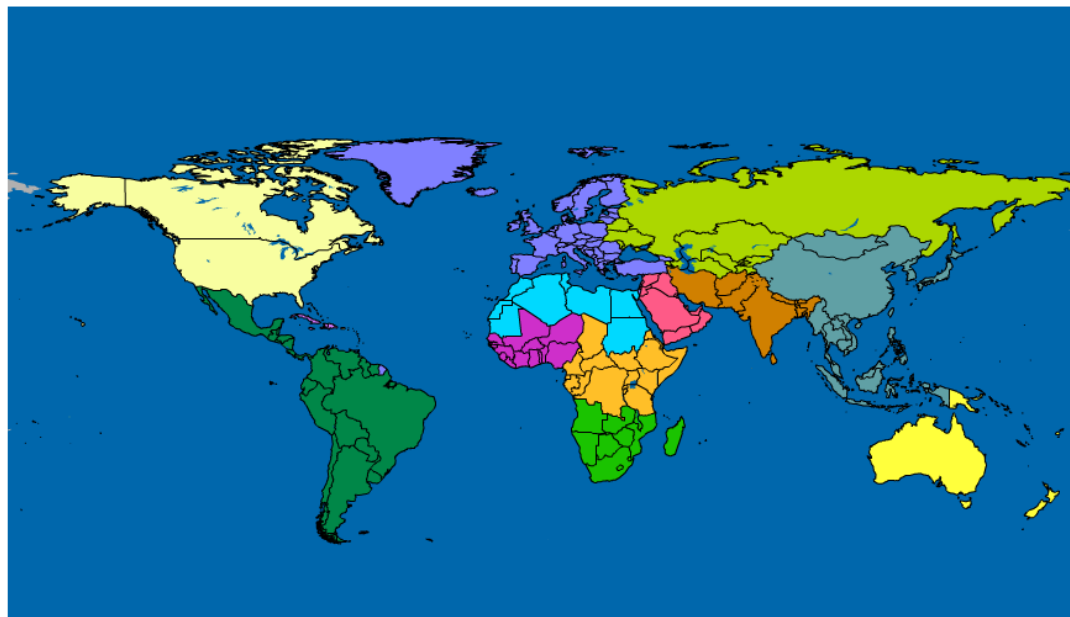
Mobilizing the TVET community through the Global Network

UNESCO-UNEVOC undertakes its activities through a worldwide network of UNEVOC Centres in more than 165 countries. The UNEVOC Network is the only network of TVET institutions with a global outreach. As an exclusive global platform, it acts as a platform for UNESCO to pursue its integrated approach to

further mainstream South-South and North-South-South cooperation in TVET, links and fosters interaction and learning among diverse institutions of TVET stakeholders around the world.

The aims of the Network are to promote international cooperation, contribute to the development of TVET systems, develop capacities of UNEVOC Centres and practitioners and to become an inclusive learning community. UNEVOC manages the global coordination among UNEVOC Centres with the Cluster Coordinator for each region.

On policy and capacity building, the UNEVOC Centres contribute in TVET development with effective influence in policymaking at national level and effective facilitation of information flow within the country. At country level, the UNEVOC Network provides a framework for collaboration in thematically addressing local issues with global



Clustering of UNEVOC Networks across the globe



UNEVOC Network world map; source: UNESCO-UNEVOC

impact. The Centres are also engaged in regional and inter-regional cooperation whereby policy experience sharing, policy learning, collective strategic thinking and regional integration are effectively facilitated.

Moreover, UNEVOC provides the Network with opportunities to collaborate online and in face-to-face meetings. Information and knowledge about different aspects of TVET are cross-shared, thereby broadening the base for clarifying and creating common understanding of TVET issues, challenges, solutions and best practices. UNEVOC facilitates knowledge sharing through research and evidence-based studies, online communities, organizing e-Forums (four virtual conferences every year), the UNEVOC Network Portal and TVETipedia which host various information about Networks and user-generated information and updates on TVET in each country, respectively. Recently, UNEVOC has built up a World TVET Database of TVET systems and information from UNESCO member countries and has collected and evaluated promising practices in TVET consistent with UNEVOC's functions on clearinghouse and informing the global debate.

Challenges

Amid these provisions, there are challenges within the diverse Network of UNEVOC Centres at different levels of TVET development and commitment. Extending the network to function as an "inclusive learning network" necessitates robust partnership building, cooperation and mutual support. Engaging more players from least developing countries in the dialogue, enhancing capacities in initiating promising practices, increasing access to professional support for teachers and outreach are some of the pressing setbacks in fully engaging the Network and facilitating North-South and South-South cooperation.

Opportunities

Through the Network, UNESCO-UNEVOC channels a dynamic flow of communication into the global debate and vice versa. Recently, the Centre induced a strategic revamp to further harness the Network's potentials, improve coordination and increase effectiveness. The revamp was underpinned by increasing efficiency to play a more catalytic role in developing TVET in the member countries, defining their roles within the larger network, engaging the Network in re-

source and knowledge management and online services and scaling up South-North-South-South collaboration.

In line with the aims of the revamp, UNESCO-UNEVOC uses technologies and collaboration tools to communicate, create dynamic interaction and connect Networks into engaging discussions. When effectively networked, UNEVOC Centres can further improve national, regional and global policy processes through better information use and by marshalling evidence and increasing the influence of good-quality evidence in the policy process.

Crafting new directions for TVET

TVET is expected to contribute to the achievement of the post-2015 EFA (Education for All) goals and in supporting the transformative shifts for the post-2015 agenda. Sustainable development and the driving of economies for more jobs and inclusive growth underpin these shifts in education. The Network as a strategy for cooperation builds on opportunities to take up these issues and develop locally relevant strategies with global impact. To this end, UNEVOC creates platforms to cultivate this type of cooperation. Five regional meetings highlighting the Network's promising practices in addressing the challenge of Greening TVET and tackling youth unemployment in UNESCO's five regions Asia and the Pacific, Latin America and the Caribbean, Arab States, Africa and Europe and North America have been slated for 2013, the first two regional meetings (Korea and Costa Rica) were successfully organized with excellent feedback. Promising practices will be shared inter-regionally to further set a momentum for global promising practices.

UNEVOC is currently leading the development of the Greening TVET framework that will serve as a reference standard for TVET institutions to facilitate a whole-institution approach to developing skills for green development. The Centre is leading an international working group on "Greening TVET and Skills Development" with the Asian Development Bank, the European Centre for the Development of Vocational Training (CEDEFOP), the European Training Foundation, the International Labour Organization, the Organisation for Economic Co-Operation and Development (OECD), the United Nations Institute for Training and Research, and the United Nations Economic Commission for Europe.

The networking opportunities, thus, set the stage and context for learning new policy approaches in transforming and expanding TVET and drive greater participation in the global TVET debate and in monitoring.

In further strengthening the contributions of the host Government, Germany, in facilitating the sharing of technical experiences, technologies, knowledge and skill and vocational training practices, UNESCO-UNEVOC regularly hosts global and regional fora in Germany, works closely with German institutions and increases the Network participation in various international events hosted in Germany including the 42nd WorldSkills Conference 2013 in Leipzig and the yearly Trade Fair for Water, Sewage, Waste and Raw Materials Management in Munich.



Weitere Informationen

UNESCO-UNEVOC

→ <http://www.unevoc.unesco.org/go.php>

The Intergovernmental Bioethics Committee of UNESCO

In the world shaped by the rapid advancement of science and technology, having an ethical framework that safeguards the rights and the dignity of human beings is a well-recognized necessity. The bioethical challenges associated with these developments transcend the national boundaries of particular countries, and increasingly call for a global approach. UNESCO, with its multidisciplinary mandate that covers social and human sciences, offers a unique global platform for international cooperation in bioethics.

UNESCO has two statutory bodies in bioethics for which the Social and Human Sciences Sector serves as the Secretariat: the International Bioethics Committee (IBC) and the Intergovernmental Bioethics Committee (IGBC). While IBC is a body of 36 independent experts appointed by the Director-General of UNESCO, IGBC is composed of the representatives of 36 Member States elected by the

General Conference of UNESCO, and remains the only intergovernmental body in the world with a specific mandate in bioethics.

The existence and the functions of IGBC are closely related to the mission of IBC. It is important to note that from its establishment in 1993 until 1998 the IBC operated without statutes or rules of procedure. The adoption of the Universal Declaration on Human Genome and Human Rights in November 1997 by the General Conference of UNESCO marked a new stage in the life of the Committee. The Declaration stipulated in Article 24 the role of IBC in the dissemination of the principles set out in the Declaration, in further examination of issues raised by their applications and by the evolution of the technologies in question, and in making recommendations and advices to the General Conference. Thus, the adoption of the Declaration necessitated a set of statutes defining the duties and terms of reference of IBC.

Towards this end, the General Conference also adopted a resolution inviting the Director-General of UNESCO to convene an ad hoc working group with balanced geographical representation, composed of representatives of Member States, with a mandate to advise him on the constitution and the tasks of the International Bioethics Committee with respect to the Universal Declaration.

Pursuant to the above-mentioned resolution, the Director-General convened the Ad Hoc Working Group in March 1998, with representation from 26 Member States of UNESCO. The work of the group was also enriched by the participation of observers from six other Member States; from two non-Member States at that time; and from an international NGO.

In discussing the composition of IBC, the majority of the group agreed that, while the members of IBC should be guaranteed intellectual independence, states should be involved in its work. There were two schools of thought in that connection. The first, on the basis of past experience, wished members of IBC to be appointed in their personal capacity, in view of the fact that IBC would be open to states on an ad hoc basis when it was called upon to deal with matters concerning the follow-up to the Declaration. According to the second school of thought, because of the new situation brought about by the adoption of the Declaration, which allowed a consensus to emerge, IBC should be a body that would

keep pace with the development of research in biology and genetics and its applications through ethical and legal reflection based on the economic, social, cultural and political realities of the states that were responsible for the implementation of the Declaration.

In its conclusions, the group emphasized that it was important for the results of IBC's work to be communicated to states, particularly when questions likely to have legal, social, economic and political consequences at national level were at issue. It was, after all, the responsibility of the states subsequently to introduce the necessary measures and integrate bioethics into national legislation and practices in order to promote the principles set out in the Declaration. It is to this end that the group proposed the establishment of IGBC under Article 11 of the draft Statutes of IBC, specifically to examine the advice and recommendations of IBC; to inform the IBC of its opinions in this regard; and to submit its opinions to the Director-General for transmission, together with the advice and recommendations of IBC, to Member States, as well as the governing bodies of UNESCO. The statutes were approved by the Executive Board of UNESCO at its 154th session in May 1998 (154 EX/Decision 8.4), thus formally establishing IGBC as an intergovernmental body of the Organization.

It is also interesting to note that Article 11 allows for the convening of a Joint Session of IBC and IGBC to foster dialogue between the two Committees on matters of mutual concern, including amending the Universal Declaration on the Human Genome and Human Rights or the adoption of further declarations or any other international instrument in bioethics. Since then, it is through this mechanism that the two statutory bodies were able to facilitate consensus amongst Member States of UNESCO in adopting the International Declaration on Human Genetic Data (2003), and the Universal Declaration on Bioethics and Human Rights (2005).

The sessions of IGBC are convened at least once every two years. At its 5th session in 2007, the Committee invited the Director-General to examine ways and means that can enable IGBC to contribute in the early stages to the ongoing deliberations of IBC on the issues related to the follow up to the UNESCO Declarations in the field of bioethics. As a result, since 2008, the Director-

General has convened a Joint Session of IBC and IGBC every two years specifically to foster dialogue and interaction between the two committees on a more regular basis.

At its recent 8th session in September 2013, IGBC examined the work of IBC on the Principle of Non-Discrimination and Non-Stigmatization (as set out in Article 11 of the Universal Declaration on Bioethics and Human Rights) and on the Report of IBC on Traditional Medicine Systems and their Ethical Implications. As an occasion to commemorate the 20th anniversary of bioethics at UNESCO, IGBC also engaged in a reflection about the future direction of the Bioethics Programme, as well as on possible improvements to the working methods between IBC and IGBC.



Weitere Informationen

Intergovernmental Bioethics Committee (IGBC)

→ <http://www.unesco.org/new/en/social-and-human-sciences/themes/bioethics/intergovernmental-bioethics-committee/>

Conclusion of the 8th session

→ <http://www.unesco.org/new/en/social-and-human-sciences/themes/bioethics/intergovernmental-bioethics-committee/igbc-sessions/eighth-session-paris-2013/>

Der 5. IPCC-Bericht: Geballte Klimakompetenz

Wie hart trifft der Klimawandel die Erde und die Menschheit? Wie hoch steigen der Meeresspiegel und die Temperaturen in einzelnen Regionen tatsächlich? Diese und viele andere Fragen rund um den globalen Wandel zu beantworten, ist Aufgabe des Weltklimarats IPCC. Daneben wird auch untersucht, wie der Klimawandel abzumildern wäre oder wie sich die Menschheit an ihn anpassen könnte.

Der *Intergovernmental Panel on Climate Change* (IPCC) soll Politikern weltweit umfassend und objektiv den aktuellen Stand der wissenschaftlichen Klimaforschung an die Hand geben. Damit bietet er Grundlagen für politische Entscheidungen, ohne konkrete Handlungsempfehlungen auszusprechen. Der IPCC forscht nicht selbst, sondern trägt die Ergebnisse tausender Wissenschaftler zusammen. Dazu veröffentlicht er Sachstandsberichte, die *IPCC Assessment Reports*.

Dieser Artikel ist ein Auszug aus der Publikation „Perspektive Erde“, Ausgabe 02/2013.

Die 195 Mitgliedsstaaten verabschieden die Berichte explizit mit dem Ziel, sie als Grundlage für ihre nationale sowie internationale Klimapolitik zu nutzen. Die strengen IPCC-Verfahrensregeln sollen bewirken, dass die Informationen verlässlich, ausgewogen und umfassend sind. Mit Spannung wird der 5. Sachstandsbericht erwartet. Den Auftakt bildete am 26. September 2013 der Beitrag der Arbeitsgruppe 1. Wegen der Aussagen zum verlangsamten Temperaturanstieg der Luft und zu den neuen Szenarien über das mögliche Abschmelzen der Polkappen und zur Häufigkeit von Hochwasser und Stürmen war das öffentliche Interesse besonders groß. Im Frühjahr 2014 folgen die Beiträge der Arbeitsgruppen 2 und 3 zu Folgen, Anpassung und Minderung des Klimawandels. Der IPCC-Synthesebericht fasst im Herbst 2014 die politikrelevanten Ergebnisse der drei Arbeitsgruppen zusammen.

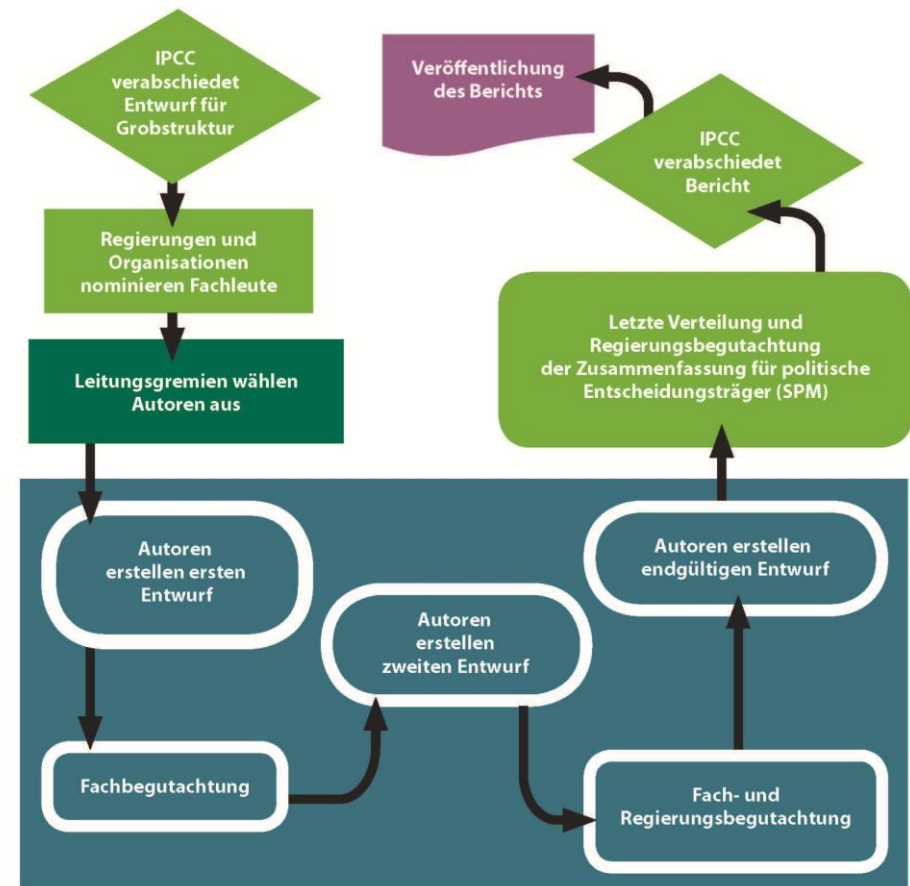
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Einen Schwerpunkt legt der IPCC diesmal auf Regionen. Nur wenn Entscheidungsträger wissen, welche Konsequenzen der Klimawandel bei ihnen vor Ort hat, können sie Strategien zur Anpassung entwickeln. Erstmals liefert der

Bericht daher einen umfangreichen Atlas mit Karten von regionalen Klimaprojektionen.

Für IPCC-Berichte gelten strenge Regeln, damit die wissenschaftlichen Aussagen so zuverlässig und ausgewogen wie möglich sind. Die Entscheidung, ob ein Bericht erstellt wird, trifft das IPCC-Plenum. Danach bestimmen politische

Entstehung der IPCC-Berichte



Entstehung der IPCC-Berichte; Quelle: Deutsche IPCC-Koordinierungsstelle

Entscheidungsträger und andere Nutzer von Klimawissen die relevanten Themen. Fachleute erstellen daraus einen Abriss, auf dessen Basis Themenauswahl und Struktur des Berichts festgelegt werden.

So beschlossen die IPCC-Mitgliedstaaten 2008 den 5. Sachstandsbericht. Für alle Kapitel wurden Leitautorenteams berufen. Besonders wichtig ist die wissenschaftliche Qualifikation, aber auch eine ausgewogene Zusammensetzung der Teams: verschiedene Weltregionen und beide Geschlechter sind gleichermaßen vertreten.

Die 195 Mitgliedsstaaten und etwa 100 akkreditierte Beobachterorganisationen schlugen Autoren und Begutachtungsedatoren vor. Rund 3.000 Experten wurden nominiert, davon kommen mehr als 100 aus Deutschland. Der IPCC-Vorstand wählte 830 federführende Autoren aus, davon 40 deutsche Experten.

Seit Sommer 2010 schrieben die Autorentteams unter Leitung der Arbeitsgruppen-Vorsitzenden an dem mehrere tausend Seiten starken 5. Sachstandsbericht. Dabei nutzen sie wissenschaftliche Fachzeitschriften als Quellen. Texte, die nicht von unabhängigen Gutachtern bestätigt wurden, z. B. von Behörden oder internationalen Organisationen, werden besonders sorgfältig geprüft. Die mehrstufige Begutachtung ist essenzieller Bestandteil der Erstellung des Berichts. Die erste Begutachtung erfolgt durch wissenschaftliche Fachleute, bei der zweiten sind auch Regierungsexperten der Mitgliedsstaaten beteiligt. Die Begutachtung soll objektiv, offen und transparent sein und so möglichst viele unabhängige Experten involvieren. In Deutschland sind etwa 700 Fachleute zur Begutachtung eingeladen. Insgesamt gehen für jede Arbeitsgruppe mehr als 50.000 Kommentare ein, die angemessen beachtet werden müssen. Konträre Ansichten, Wissenslücken und Unsicherheiten werden im Bericht klar dargestellt. Die vorläufigen Entwürfe sind während der Begutachtungen vertraulich. Nach der Verabschiedung werden alle Unterlagen veröffentlicht. So ist die Entstehung für die Öffentlichkeit in allen Details nachvollziehbar.

Schließlich werden die etwa 30-seitigen Zusammenfassungen für politische Entscheidungsträger bei einer Plenarsitzung von den Regierungen verabschiedet. Diese achten darauf, dass die Aussagen vollständig, verständlich und ausgewogen sind. Es dürfen nur Informationen aus den zugrundeliegenden Berich-

ten genutzt werden. Die Autoren entscheiden, ob die vorgeschlagenen Formulierungen korrekt sind. Durch Zustimmung zu den IPCC-Berichten erkennen die Regierungen deren wissenschaftliche Aussagen an.

Interview mit Prof. Dr. Ottmar Edenhofer, Chefökonom des Potsdam-Instituts für Klimafolgenforschung (PIK) und Ko-Vorsitzender der IPCC-Arbeitsgruppe 3.

Ende September hat der IPCC den Bericht der Arbeitsgruppe 1 zu den wissenschaftlichen Grundlagen vorgelegt. Was kommt danach?

Prof. Dr. Ottmar Edenhofer: Der IPCC hat den aktuellen Wissensstand darüber vorgelegt, wie das Klimasystem auf menschliche Aktivitäten reagiert. Dieses Wissen ist Grundlage für die Abschätzung der Folgen des Klimawandels und für Strategien zu seiner Verminderung. Die IPCC-Teilberichte dazu folgen im nächsten Frühjahr. Der 5. Sachstandsbericht, vervollständigt durch den zusammenführenden Synthesebericht im Oktober 2014, wird Bewegung in die Klimadiskussion bringen.

Was sind die Stärken des IPCC-Berichts? Gibt es Verbesserungsvorschläge?

Prof. Dr. Ottmar Edenhofer: Die größte Stärke sehe ich darin, dass die Berichte Handlungsmöglichkeiten für Entscheidungsträger aufzeigen. Eine politische Entscheidung soll ermöglicht werden, ohne dass die Wissenschaft einen alternativen Weg empfiehlt. Ich ziehe den Vergleich zu einem Kartographen, der gangbare Pfade in der politischen Landkarte einzeichnet, der aber nicht über die Route bestimmt. Das ist ein Alleinstellungsmerkmal des IPCC. In Zukunft könnte die Arbeitsteilung der Arbeitsgruppen überdacht werden, etwa die jetzige Trennung von Anpassung und Verminderung. Es sind auch Berichte zu enger gefassten Themenbereichen und in kürzeren Zeitabständen denkbar. Die Mitglieder des IPCC, die Regierungen, entscheiden darüber.

Welche Rolle sollte Ihrer Meinung nach der IPCC zukünftig als politikberatendes Gremium spielen?

Prof. Dr. Ottmar Edenhofer: Der IPCC ist eine etablierte Plattform für die Kommunikation von Wissenschaft und Politik, die weiter genutzt werden sollte. Die

Mitgliedsstaaten der UN-Klimarahmenkonvention haben sich zum Ziel gesetzt, bis 2015 ein Abkommen auszuhandeln, das gefährlichen Klimawandel vermeidet. Die hierfür notwendigen Ziele und Maßnahmen sollen im Lichte der IPCC-Berichte geprüft werden. Und der Informationsbedarf der Politik wird fortbestehen: Ein globales Abkommen sollte von Beginn an auf Wirksamkeit und Verbesserungsmöglichkeiten geprüft werden.

Welche Impulse folgen daraus für die Forschungs- und Klimapolitik?

Prof. Dr. Ottmar Edenhofer: Die Wissenschaft agiert unabhängig von ihrem Einfluss auf die Klimapolitik. Lösungsstrategien könnten jedoch auch in der Forschung in den Fokus rücken. Wie wägen wir optimal zwischen Anpassung und Verminderung ab? Was passiert, wenn bestimmte Technologien nicht zur Verfügung stehen oder einige Staaten keinem Klima-Abkommen beitreten? Es sind weiterhin viele Fragen offen.

Download

Fünfter Sachstandsbericht:

Beitrag der Arbeitsgruppe 1 zu „Wissenschaftlichen Grundlagen“

→ <http://www.climatechange2013.org/>

Weitere Informationen

IPCC

→ <http://www.ipcc.ch>

Deutsche IPCC-Koordinierungsstelle

→ <http://www.de-ipcc.de>

Perspektive Erde

→ <http://www.fona.de/de/16812>

Koordination und Förderung: Programme im Wandel

Global Research Council: Interview with “Founding Father” Subra Suresh

National governments cooperate on S&T issues in the OECD and in various UN bodies such as UNESCO and UNCTAD. National funding and research performing agencies also co-operate internationally. On the global level, the most well-known organization is probably the International Council for Science, which was founded in 1931. The European Science Foundation organizes regional cooperation of funding and research performing agencies since 1974. National funding agencies of the G8 (+G5) countries meet in informal circles such as the G8 HORCs (Heads of Research Councils), the International Group of Funding Agencies for Global Change Research and the Belmont Forum. National academies meet as G8 Academies and through the InterAcademy Panel.

ITB: Against this rich institutional landscape, why did you perceive the need to set up the Global Research Council (GRC)?

Dr. Subra Suresh: The GRC was set up as a different kind of organization with several unique objectives in mind:

- To bring together the leaders of major science and engineering funding agencies around the world to develop and endorse, in a collaborative and sustained manner, basic principles that are essential for successfully harmonizing global research. Such activities, for example, include development of principles of scientific peer review, research integrity/ethics, open access to publications and data, mobility of researchers, etc.



Dr. Subra Suresh
President of the Carnegie Mellon University, former Director of the National Science Foundation (2010-13)
Pittsburgh, USA

- To provide a forum and a virtual organization for those who are primarily responsible for most of the research funding in this world to interact with those from developing countries, to establish new mechanisms for North-South collaborations. In 2012, about 100 countries collaborated in regional GRC meetings, including for the first time, more than 20 countries from Sub-Saharan Africa.
- To find ways in which research funders and research performers may collaborate to establish robust scientific practices that ultimately facilitate common projects and policies, which, in turn, encourage development of shared research facilities, collaboration on global challenges, and practices to sustain public access to publications and data. Satellite activities, such as a planned forum of leading research performers and educators from academia, government, non-profit, and for-profit organizations, to be held in Washington DC in April 2014, will further strengthen the scope and impact of GRC.

The enthusiastic response from both developing and developed countries in support of the formation of GRC, and the increasing interest from many countries in attending and organizing the regional and annual meetings, point to not only the need for an organization such as GRC, but to the unique importance of its mission and vision.

The GRC is founded on the belief, “Good science anywhere is good for science everywhere” (Suresh, Science, Editorial, 25 May 2012).

It is true that there are many other effective regional and multilateral research funding agencies, but their focus and purposes are narrower than GRC. GRC members are responsible for most of science and engineering funding in the



world. It is not a funding agency, but it addresses concerns that, more and more, are affecting the work of the world's research funders. Research spending has been growing: in 2012, the world collectively spent about USD 1.5 trillion on science and engineering research and development (adjusted for purchasing power parity).

This is wonderful news for the world. But the GRC was established to address the consequences of a fundamental “disconnect” at the heart of this infrastructure: the funding for research – the input to the scientific enterprise – is mostly and necessarily decided by local and national policies and priorities. The output of this research, however, has no borders in our increasingly interconnected world.

This disconnect in scope between input and output raises many questions: In such a borderless world of education and research, what are the best models for collaboration amid stiff competition? What are the mechanisms to collectively ensure that good science develops in a harmonious way through global collaboration? Who develops common practices for collective action on open access, and who pays for permanently archiving this information across rapidly changing platforms? Who works to ensure that common principles of engagement and standards and quality of output are collectively developed and adhered to? At a time when many nations are fiscally constrained in their ability to support and nurture scientific research, how do we best leverage precious resources for collective good?

Further, investigators on international teams depend on clear norms about how research is conducted, such as standards of ethics and integrity in research practice. There are also issues related to merit review, and to accessing, sharing, and archiving results and data while ensuring privacy, confidentiality, and intellectual property rights. Without mechanisms for developing such principles of engagement, global science will have only constrained growth.

None of these questions have obvious or simple answers. But members of GRC collectively have unique stature, perspective, and bandwidth to address these issues over a period of many years. It is a pleasure to see the enormous interest from them to do exactly that.

ITB: To what extent does the GRC represent a new type of international organization?

Dr. Subra Suresh: It is different in several ways – first, as I noted above, the GRC is open to all countries with research funding agencies. Second, its mission is to bring together developing and developed countries to build a shared vision whereby countries new to the scientific enterprise can benefit from the experiences of those with well-established practices. Third, such a diversity of perspectives in itself is likely to lead to innovative approaches to many common issues as they will self-correct one another's hidden biases. Fourth, GRC is a virtual entity. There is no central office with a directorate or staff, and there is no direct transfer of money across borders. Fifth, it has a very focused and actionable agenda for each annual meeting: each year the group develops and endorses select action plans.

ITB: The US National Science Foundation, together with the German Research Foundation played an important role in the creation of the GRC. In your view, could the model of an independent national funding organization be transferred to other countries through the operation of the GRC?

Dr. Subra Suresh: There are several countries that have, over the past decade, established their own national funding agencies modelled after the US National Science Foundation. Of course, these entities have to be appropriately adapted to local conditions, national political structures, and the stage of development of the country. GRC could serve as a forum that helps facilitate best practices for the scientific enterprise among developed and developing countries.

ITB: International declarations on research and development (R&D) issues have not been in short supply. The foundational document of the GRC lays down that each Annual Meeting is to adopt statements and standards. In the first two years of its operation, the GRC has adopted standards for merit review (2012) and research integrity (2013). Regarding open access to publications, an action plan has been adopted in 2013. How will the GRC deal with matters of national implementation?

Dr. Subra Suresh: Open access to publications and data is a very complex topic that must involve conversation among different stakeholders (e.g., academia,

government funding agencies, professional societies, for-profit and non-profit scientific publishers). It is a long-term goal for collective action that also has to focus on development of a sustainable financial model for open access. Following the 2013 meeting in Berlin, the GRC is taking up this issue through regional meetings, so that further progress can be made when members meet in Beijing in 2014.

ITB: In the long term, do you see a potential role for the GRC in the funding of joint projects?

Dr. Subra Suresh: That is a long-term goal. It necessarily requires agreed-on principles of engagement, which GRC is successfully beginning to address in its annual meetings. Joint projects are already happening in significant ways in certain areas, such as astronomy or particle physics. The GRC has the potential to develop broad policies and practices for facilitating joint research projects and shared infrastructure in many other areas.

Die Fragen an Dr. Subra Suresh stellte

Dr. Sonja Bugdahn, Tel. 0228/3821-1474, sonja.bugdahn@dlr.de

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GRC Action Plan Towards Open Access

→ http://www.dfg.de/download/pdf/dfg_magazin/internationales/130528_grc_annual_meeting/grc_action_plan_open_access.pdf

GRC Statement of Principles for Research Integrity

→ http://www.dfg.de/download/pdf/dfg_magazin/internationales/130528_grc_annual_meeting/grc_statement_principles_research_integrity.pdf

GRC Statement of Principles on Scientific Merit Review

→ http://www.globalresearchcouncil.org/sites/default/files/pdfs/gc_principles-English.pdf

Subra Suresh: Global Challenges need Global Solutions. In: Nature, Vol. 490, 18. October 2012

→ <http://www.nature.com/nature/journal/v490/n7420/full/490337a.html>

Weitere Informationen

Global Research Council (GRC)

→ <http://www.globalresearchcouncil.org>

GRC Annual Global Meeting Berlin 2013

→ http://www.dfg.de/en/magazine/dfg_international/130528_grc_annual_meeting/

Multilaterale Förderung für multilaterale Forschung: Ansätze der Deutschen Forschungsgemeinschaft

Kernaufgabe der Deutschen Forschungsgemeinschaft (DFG) ist die wettbewerbliche Auswahl und Finanzierung der besten Forschungsvorhaben an Hochschulen und Forschungsinstituten in Deutschland. Dabei fördert sie Forschung auf zweierlei Art: auf Antrag von Wissenschaftlerinnen und Wissenschaftlern und durch eigene strategische Initiativen zur Stärkung bestimmter Schwerpunkte. In beiden Fällen geht der Impuls von der Wissenschaft aus. Basis des internationalen Handelns der DFG ist demnach die Unterstützung grenzüberschreitender Kooperationen, wie sie aus der Wissenschaft heraus an die DFG herangetragen werden.

Viele der DFG-geförderten Vorhaben umfassen internationale Kooperationen, die selbstverständlich von der DFG-Zuwendung abgedeckt sind. Dabei kann die DFG allerdings nur in Ausnahmefällen die ausländischen Projektanteile übernehmen. Daher bringen internationale Partner entweder aufgrund ähnlicher Förderung eigene Mittel ein oder stellen hierfür bei den heimischen Förderorganisationen spezielle Anträge. Diese benötigen häufig besondere Bedingungen (z. B. themenspezifische Ausschreibungen, Abkommen mit der DFG), um internationale Komponenten eines Projekts fördern zu können. Außerdem gibt es immer wieder Bedarf, eine Kooperation bewusst als gemeinsames Projekt parallel zu beantragen. Deswegen besteht eine Fülle von bilateralen Kooperationsabkommen, die die synchrone Förderung der einzelnen Partner ermöglichen sollen.

Multilaterale Förderung – Aufbau integrierter Forschungsräume

Eine besondere Herausforderung stellt die Administration von Anträgen auf multilaterale Kooperationen dar, die drei oder mehr Förderorganisationen betreffen. Dabei streben die DFG und ihre ausländischen Partnerorganisationen effizienzsteigernde, grenzüberschreitende Begutachtungs- und Entscheidungsverfahren an. Zu erproben ist der vertrauensvolle Umgang der Förderorganisationen miteinander, die Harmonisierung von Förderbedingungen und Begutachtungspraxis, aber auch die formale Abstimmung der Forschenden über nationale Grenzen hinweg. Das Standardgeschäft aller nationalen Förderorganisationen sind Pro-

jekte im jeweiligen Land, die selbstverständlich mit den bestmöglichen Partnern weltweit kooperieren sollen. Die DFG stellt ihnen dazu die notwendigen Mittel in allen ihren Förderverfahren zur Verfügung. Dies ist nicht überall so möglich. Aber selbst wenn, bedeutet dies nicht, dass die beteiligten Partner aus verschiedenen Ländern die nötigen Mittel synchron zur Verfügung haben und so tatsächlich zeitnah zur gemeinsamen Forschungsidee kooperieren können. Daher soll auf vielfältige Weise im Interesse der Wissenschaft erprobt werden, integrierte Forschungsräume zu schaffen, wie sie die DFG z. B. im Rahmen ihrer EuroHORCs-Mitgliedschaft (jetzt Science Europe) in der sogenannten Roadmap für Europa mit beschlossen hat.

Die DFG bevorzugt hierbei prinzipiell themenoffene Verfahren, nimmt aber zur Verfahrenserprobung oder aus fachstrategischen Gesichtspunkten auch an thematischen Initiativen teil. Beispielhaft seien hier einige vorgestellt, die in einem zweistufigen, multinationalen Antragsverfahren die besten Projekte zur Förderung auswählen. Typischerweise kommt hierbei ein gemeinsames Sekretariat auf Seiten der Förderer zum Einsatz. Nach kurzen Voranträgen wird eine kleinere Anzahl von Vollanträgen eingeladen und gemeinsam begutachtet. Die endgültige Förderentscheidung verbleibt allerdings bei den jeweils dafür vorgesehenen Gremien der beteiligten Organisationen. Dies ist notwendig, um die einzelnen Projekte auch im nationalen Referenz- und Finanzrahmen einordnen zu können.

Open Initiative von ERA-Chemistry: Schon seit vielen Jahren kooperieren in Europa Förderorganisationen in der Chemie. Dies mündete 2004 in das ERA-Net ERA-Chemistry unter DFG-Koordinierung. Die darin gegründete *Open Initiative* ermöglicht seit 2008 in jährlichen Ausschreibungen, an denen sich eine wechselnde Zahl an EU-Länder beteiligen, bi- oder trilaterale Projekte zu frei wählbaren Themen innerhalb der Chemie.

IUPAC-Initiative: Unter dem Dach der *International Union of Pure and Applied Chemistry* (IUPAC) entschieden sich Förderorganisationen aus Brasilien (FAPESP), Deutschland (DFG), Frankreich (CNRS), Irland (IRCSET), Portugal (FCT), Spanien (MICINN) und den USA (NSF) 2009 zu einem Pilotversuch einer gemeinsamen Ausschreibung für trilaterale Projekte auf dem Gebiet der

Polymerchemie. Am Ende des Pilotprojekts steht eine kritische Auswertung und ein öffentlich verfügbarer Leitfaden für multilaterale Ausschreibungen. Inzwischen widmet sich die aktuelle Ausschreibungsrunde dem Gebiet der nachhaltigen Katalyse-Forschung.

Open Research Area in Europe for the Social Sciences (ORA): Die bilateralen Kooperationen in der Förderung sozialwissenschaftlicher Forschung der DFG mit der niederländischen NWO, dem britischen ESRC und der französischen ANR sowie dieser Organisationen untereinander sind lange etabliert. 2009 hat man sich zu jährlichen gemeinsamen Ausschreibungen entschlossen, um so nun auch multilaterale Kooperationen zu ermöglichen. Für die ORA-Ausschreibung 2013 wurde unter dem Stichwort *ORA plus* die US-amerikanische NSF als weitere Partnerin hinzugenommen. 2011 erfolgte eine sehr erfolgreiche Ausschreibung mit dem *Indian Council of Social Science Research*. Bis Anfang Dezember 2013 konnten Vorschläge für eine europäisch-chinesische Ausschreibung eingereicht werden. Großes Interesse an der Teilnahme besteht auch seitens Japan. Nach Abschluss der Runde 2013 will ORA prüfen, ob eine Erweiterung des Konsortiums sinnvoll und auch realisierbar ist.

G8-Initiative: Einen noch breiteren Rahmen haben sich die G8-Partner Deutschland (DFG), Frankreich (ANR), Japan (JSPS), Kanada (NSERC), Russland (RFFI), UK (RC-UK) und USA (NSF) gesteckt. Sie wollen größere multilaterale Projekte erproben, also die gemeinsame Bearbeitung und Förderung von Konsortien aus im Schnitt fünf bis sechs Ländern. Hierzu hat man sich auf drei Pilot-ausschreibungen geeinigt – 2010 (Exascale Computing), 2011 (Material Efficiency), 2012 (zwei Themen: Freshwater Security, Coastal Vulnerability). 2012 wurde die Ausschreibung und Auswahl vom Belmont Forum übernommen und damit um Förderorganisationen aus Australien, Brasilien, Indien und Südafrika erweitert. Eine systematische Evaluierung der G8-Initiative wurde gerade mit einer Fragebogenaktion begonnen.

Infektiologie: Nicht der Erprobung sondern der gezielten Stärkung eines Wissenschaftsgebietes dient die Afrika-Initiative zur Infektiologie. Sie begann 2009 mit einer ersten Ausschreibung und setzt einen Fokus auf sogenannte vernachlässigte Krankheiten. Mit der Förderung deutsch-afrikanischer Kooperationspro-

jekte allein aus Mitteln der DFG will diese die Bekämpfung von Infektionskrankheiten voranbringen – die Beteiligung von Forschenden aus den betroffenen Ländern und die Unterstützung beim Aufbau einheimischer Forschungskapazitäten sind dabei zentrale Anliegen, wie auch das Ziel, langfristig der deutschen Wissenschaft in Afrika Forschungsmöglichkeiten zu erschließen. Erwünscht ist auch die Stärkung der innerafrikanischen wissenschaftlichen Vernetzung, daher können auch mehrere afrikanische Partner an einem Projekt beteiligt sein. Inzwischen wurde die Initiative zum fünften Mal ausgeschrieben.

Die IUPAC- und G8-Initiative erproben das Miteinander vieler Förderorganisationen, die themenoffenen Ausschreibungen in Chemie und den Sozialwissenschaften versuchen bereits eng kooperierende Forschungsräume weiter zu integrieren und die Afrika-Initiative stärkt strategisch ein für die DFG wichtiges Fachgebiet. All diese Initiativen werden bewusst stark eingegrenzt. Typischerweise gehen 50-200 Vorschläge ein und letztlich werden 6-30 Konsortien gefördert.

Die hier beschriebenen Initiativen laufen seit ca. fünf Jahren und die ERA-Net Aktivitäten, wie sie von der EU-Kommission im 7. Forschungsrahmenprogramm initiiert und unterstützt wurden, sind auch nicht viel älter. Für eine Bewertung ist es daher noch zu früh. Die multilaterale Zusammenarbeit ist für die beteiligten Organisationen mit einem hohen administrativen Mehraufwand gegenüber der nationalen oder auch bilateralen Forschungsförderung verbunden. Erst nach einer Reihe von gemeinsamen Förderrunden lässt sich feststellen, ob sich dieser Mehraufwand erheblich reduzieren lässt oder systemimmanent und damit hinzunehmen ist. Dasselbe gilt für einen möglichen Nutzen durch eine deutlich vereinfachte internationale Kooperation. Auch dieser kann erst nach mehreren Runden von Forschungsprojekten ermittelt werden und so in eine klare Kosten-Nutzen-Analyse einfließen.



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Download

EUROHORCs and ESF Vision on a Globally Competitive ERA and their Road Map for Actions (2008)

→ http://www.esf.org/fileadmin/Public_documents/Publications/SPB33_ERARoadMap.pdf

Weitere Informationen

Science Europe

→ <http://www.scienceeurope.org/>

ERA-Chemistry

→ <http://www.erachemistry.net/>

International Union of Pure and Applied Chemistry (IUPAC)

→ <http://www.iupac.org/project/2010-032-3-400>

Open Research Area in Europe for the Social Sciences (ORA)

→ http://www.dfg.de/en/research_funding/international_cooperation/open_research_area/about_ora/index.html

The G8 Research Councils Initiative on Multilateral Research Funding and Belmont Forum

→ <http://www.dfg.de/g8-initiative>

2012 International Opportunities Fund

→ <http://www.kooperation-international.de/detail/info/internationale-opportunities-fund-iof.html>

Deutsch-afrikanische Kooperationsprojekte in der Infektiologie

→ http://www.dfg.de/foerderung/internationale_kooperation/kooperation_afrika/#micro1781577

A Step Change for Earth System Research: Future Earth – Research for Global Sustainability

More integration between scientific disciplines and between the scientific, development and policy communities have been called for by nations and organisations around the world to address the mounting challenge of a transition to sustainability in general and sustainable development in particular.

The scientific community has responded to this call and initiated Future Earth, a 10-year international research programme, designed to provide knowledge required for societies in facing the challenges posed by global environmental change and to identify opportunities for transitions towards sustainability. Future Earth will collaborate and coordinate with other initiatives such as the Sustainable Development Solutions Network, the Global Framework for Climate Services, UNESCO's Education for Sustainable Development and contribute to the scientific underpinning for the Sustainable Development Goals Process.

Future Earth will address issues critical to human development and ecosystem resilience, including research on food, water and energy. It aims to develop new knowledge about human security, risk governance, modelling and predicting tipping points, understanding the economics of action and inaction, and contributing to transformations towards low-carbon economies, sustainable use and conservation of biodiversity. Such connected and global changes and the social responses they imply must account for culture, lifestyles, ethics and values with an increasing sensitivity to regional differences. Research in Future Earth will be co-designed and co-produced (see next page, figure 1) by researchers, entrepreneurs, policymakers and civil society. It will encompass bottom-up ideas from the wide scientific community, be solution-oriented, and inclusive of existing international Global Environmental Change projects and related national activities.

The initial research themes and conceptual framework of Future Earth

The conceptual framework for Future Earth (see next page, figure 2), which will guide the formulation of research themes and projects, recognises that people

are an integral part of the dynamics and interactions of the Earth system, and is expressed as a set of three broad and integrated research themes:

Dynamic Planet: Understanding how planet Earth is changing through the interactions of natural phenomena, and with human activities. This will be achieved through improved understanding of the Earth Systems' functions and interactions combined with intensified and novel research on mapping, understanding and projecting global change processes and interactions between social and environmental changes across scales. The Future Earth research emphasis will be on observing, understanding, explaining, projecting Earth environmental and societal trends, drivers, processes and interactions; anticipating global thresholds and risks.

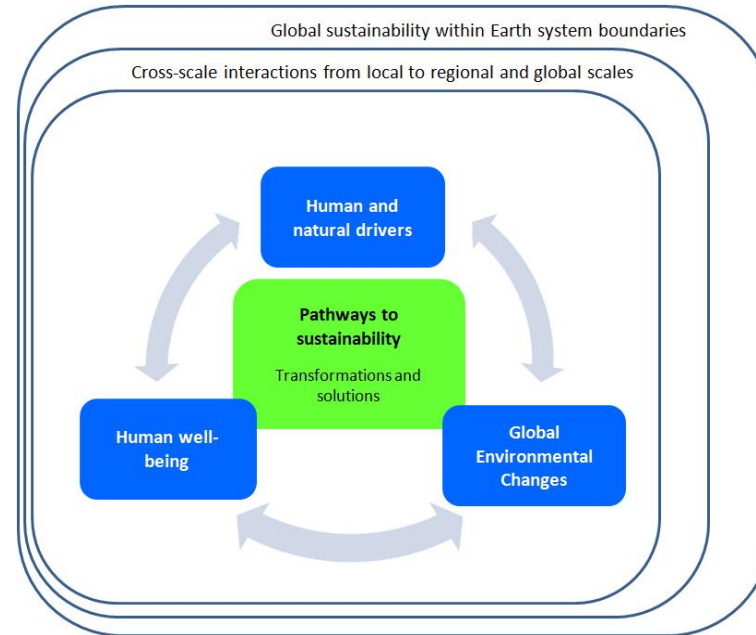


Figure 2: Schematics of the Future earth conceptual framework

Global Development: Understanding how to provide for sustainable, secure and fair stewardship of food, water, energy and materials, while maintaining critical ecosystem functions and services globally. The emphasis of Future Earth research will be on determining the impact of human activities and environmental change on human well-being, people and societies through integrated social-environmental research and the identification of sustainable solutions.

Transformation towards Sustainability: Understanding transformation processes and options, assessing how these relate to human values, emerging technologies, and economic development pathways, and evaluating strategies for governing and managing the global environment across sectors and scales. The spectrum of Future Earth research will range from internationally coordinated fundamental earth system science to trans-disciplinary research with an emphasis on solution-oriented science that enables societal transitions to sustainability. This will include research on how to anticipate, avoid and manage global

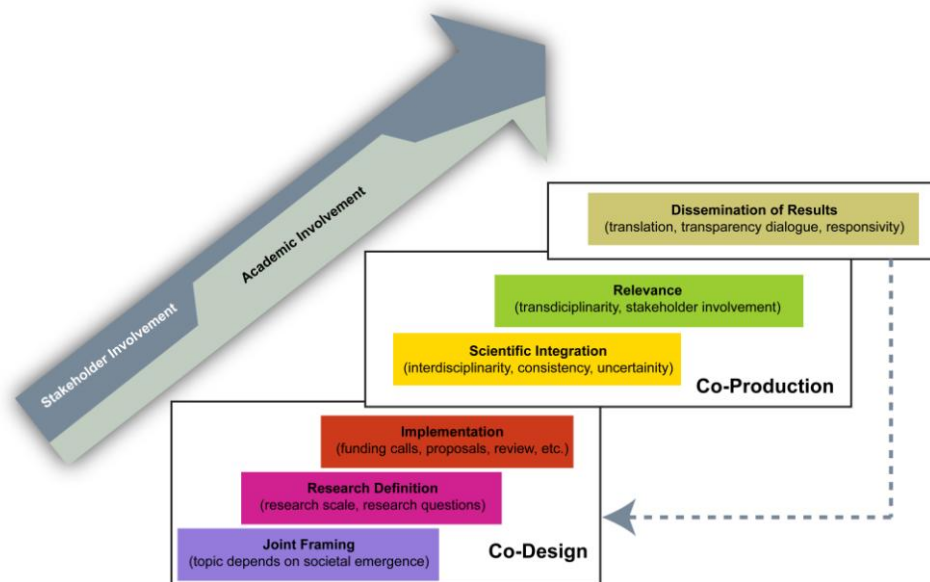


Figure 1: Steps and involvement of stakeholders in the co-design and co-production of scientific knowledge (Mauser W., Klepper G., Rice M., Schmalzbauer B., Hackmann H., Leemans R., Moore H.: Transdisciplinary global change research: the co-creation of knowledge for sustainability, 2013, Current Opinion in Environmental Sustainability, <http://dx.doi.org/10.1016/j.cosust.2013.07.001>).

environmental change through transformative development pathways and scenarios, socio-technical innovation, and on institutional, economic, social, technological and behavioural changes leading to global sustainability. Attention will also be paid to how these changes might best be implemented.

These research themes will guide and frame Future Earth activities aimed at scientific integration and co-production with practitioners and decision-makers. They will build on the success of existing Global Environmental Change programmes and projects and will be worked out in more detail jointly with the international community.

Future Earth cross-cutting capabilities, education and capacity building

Addressing the Future Earth research themes will depend on cross-cutting capabilities, such as observing networks, high performance computing, Earth system models, data management systems and research infrastructures and foster appropriate partnership arrangements. Future Earth will also partner with programmes and networks that work in the educational sector to ensure dissemination of research findings and learning across different societal arenas. In addition the programme will develop a multi-level approach to capacity building, involving both scientific researchers and practitioners.

Future Earth governance and support

Future Earth will build upon and integrate the existing Global Environment Change Programmes – the International Geosphere-Biosphere Programme, the International Human Dimensions Programme, DIVERSITAS, the World Climate Research Programme and the Earth System Partnership. Members of the Science and Technology Alliance for Global Sustainability have established Future Earth and will promote and support its development as its sponsors. Its members are the International Council for Science, the International Social Science Council, the Belmont Forum, UNESCO, the United Nations Environment Programme, the United Nations University, and the World Meteorological Organization in an observer capacity. The Alliance, acting for now as the Governing Council, and the Interim Director, Prof. Dr. Frans Berkhout, aim to secure new and enhanced sources of funding. In 2012, the Belmont Forum (an international forum for major funding organizations) launched a new open and flexible pro-

cess to support international collaborative research actions through annual multi-lateral calls to support environmental research (German member organizations are the Federal Ministry of Education and Research and the German Research Foundation). National committees will also be asked to play a vital role in implementing Future Earth at the national level. Germany was one of the first countries internationally to launch a National Future Earth committee in March 2013.

Future Earth represents an important new step towards both, integrating science for sustainability and making global change science more responsive to grand societal challenges. By bringing science and society closer together in the framing of research questions, the objective is to deliver science that will answer the questions people, business and governments care about, while also making these groups more responsive to the analysis and solutions that emerge from excellent scientific research.



Prof. Dr. Martin Visbeck
Former member of the Future Earth transition team
Chair of the German Committee Future Earth
Chair of Physical Oceanography, GEOMAR Helmholtz-Zentrum für Ozeanforschung, Kiel



Prof. Dr. Frans Berkhout
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Future Earth design report

→ http://www.icsu.org/future-earth/media-centre/relevant_publications/FutureEarthdraft_initialdesignreport.pdf

Weitere Informationen

Future Earth

→ <http://www.icsu.org/future-earth>

German Committee Future Earth

→ <http://www.dkn-future-earth.org/>

Future Earth blog

→ <http://www.futureearth.info/>

Call for expression of interest to host permanent secretariat of Future Earth

→ <http://www.icsu.org/future-earth/whats-new>

30th Anniversary of EU Framework Programmes of Research, Technological Development and Innovation

Started in 1984, the main aim of the first Framework Programme (FP1) has been to contribute to European integration by stimulating and supporting transborder research and development (R&D) cooperation. In addition, the founders of the programme saw the added value of different R&D actors from science and business joining forces for achieving critical mass and strengthening industrial competitiveness.

Already in 1983, the ESPRIT programme had been launched following the initiative of the Big Twelve, the major European industrial players in the area of information technologies, in order to close the “technology gap” with the USA.

The development from FP1 to FP7 and to the perspectives of Horizon 2020, the new FP for the period 2014 to 2020, was characterised by a steady increase of budgets, from ECU 3,750 billion in FP1 to more than 50 billion euros in FP7, and to about 70 billion euros expected for Horizon 2020. Although Member States investments in R&D are higher, the FPs play a strategic role having substantial impact on the orientations of national R&D policies and programmes. Thus, both directly and indirectly, they contribute to coordination of national R&D activities.

From the beginning of the FPs, two types of activities were funded: shared cost actions for collaborative R&D and demonstration projects and concerted actions for coordinating research activities and for networking. Collaboration has always been a core characteristic of European research. However, in the course of the development of the FPs further instruments evolved.

FP1 to FP4 were strongly technology oriented. There were, however, already early attempts to coordinate national R&D policies but with little success. Member States were reluctant to exchange information, let alone coordinate policies.

FP5 (1998-2002) proclaimed “A break from the past” following a problem oriented approach responding to major socio-economic challenges. It focused on a number of objectives combining technological, industrial, economic, social and cultural aspects.

The launch of the European Research Area (ERA) in 2000 and the objective of FP6 (2002-2006) supporting the creation of ERA meant a decisive step towards an explicit policy orientation of the FPs and a move of R&D towards centre stage of European policies. The aim was to stimulate the creation of ERA mainly through large strategic initiatives – Integrated Projects and Networks of Excellence – while providing also “staircases to excellence” through Specific Targeted Research Projects of medium size. In addition, EU R&D activities were complemented by the ERA-NET scheme of coordination and cooperation of national R&D initiatives, thus, leveraging also national financial means for R&D. In addition, industry led European Technology Platforms were launched with the aim of involving stakeholders into the development of Strategic Research Agendas and Technology Roadmaps providing input into FP Work Programmes.

FP7 (2007-2013) followed the goal supporting the Lisbon strategy. Specific features of FP7 are public-public and public-private partnerships – further developing partnering activities such as ERA-NETs, and launching Joint Technology Initiatives and Joint Programming Initiatives.

As a substantial step beyond the core principle of collaboration the European Research Council was started for funding individual excellent young and advanced principal investigators and their teams selected on the basis of Europe wide competition.

The European Institute of Innovation and Technology (EIT) was launched addressing the innovation deficits of the EU – the “European paradox” – by establishing Knowledge and Innovation Communities as hybrid organisations that combine groups of regional co-location centres involving all actors of the innovation web in selected areas while utilizing the potential of transnational linkages thus providing the access to new markets and also to competences in other regions.

The Marie Curie scheme for training and mobility of researchers plays an important role developing a truly European spirit among young and advanced researchers and also exposing them to new research methodologies and approaches and possible other perspectives of their research field or

interdisciplinary problems. Last but not least, the scheme strengthens the connectiveness between researchers in the EU.

Horizon 2020 (2014-2020) will play a major role supporting the Europe 2020 strategy. Its substantially increased budget shows the priority Council and Parliament put on EU R&D policy and programmes also in times of crisis. The new FP will focus on research and innovation covering the whole innovation chain while addressing societal challenges, supporting industrial leadership and promoting scientific excellence. The EIT will be an integrated crosscutting element of the new programme.

The FPs play an important role for training researchers to work in transnational, interdisciplinary and intersectoral teams and for supporting sustainable Europe wide research communities that are forming the backbone of the ERA and are essential for addressing complex problems. The long-term practice and experience of collaborative research in FPs is a particular competitive advantage of Europe whereas other regions face weaknesses in that area.

ERA-NETs and Joint Programming Initiatives but also the mobility of researchers suffer from the fact that the ERA is not completed and different rules and procedures, regulations and legal provisions between funding organisations and Member States are barriers and cause problems. After 13 years that means still a key challenge for all actors in the research system. Fundamental changes of mindsets and attitudes and willingness for alignment and joining forces putting aside too narrow institutional and national interests are required.

The FP is the strongest competitive collaborative research programme world wide. Its achievements and contributions towards strengthening European research are clearly shown by numerous assessments at national and EU level. When in the next programming period Member States and stakeholders are willing to develop even stronger European perspectives and adapt the national systems accordingly, Europe will be strong also in the future.



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Weitere Informationen

European Research Area (ERA)

→ http://ec.europa.eu/research/era/index_en.htm

Institute of Innovation and Technology (EIT)

→ <http://eit.europa.eu/>

Marie Curie Actions

→ <http://ec.europa.eu/research/mariecurieactions/>

Sixth Framework Programme (FP6)

→ http://ec.europa.eu/research/fp6/index_en.cfm

Seventh Framework Programme (FP7)

→ http://ec.europa.eu/research/fp7/index_en.cfm

Horizon 2020

→ http://ec.europa.eu/research/horizon2020/index_en.cfm

SFIC Driving Forward the EU-MS Partnership in International S&T Cooperation

SFIC (the Strategic Forum for International S&T Cooperation) is a strategic forum and an advisory body to the Council and the European Commission (EC) with a view to implementing a European Partnership in the field of international scientific and technological (S&T) cooperation. Member States (MS) and the EC are members of the Forum while countries associated to the 7th Framework Programme have an observership status.

SFIC's objective is to facilitate the further development, implementation and monitoring of the international dimension of the European Research Area (ERA) by the sharing of information and consultation between the partners with a view to identifying common priorities which could lead to coordinated or joint initiatives, and coordinating activities and positions vis-à-vis third countries and within international fora. The rationale for such framework is provided by the Council conclusions concerning a European partnership for international scientific and technological cooperation of 2 December 2008.

SFIC activities are implemented on a voluntary basis following the principle of variable geometry. SFIC is composed of up to two representatives per MS and the EC as well as observers. A Task Force is composed of voluntary SFIC

delegates and its role is to assist the Chair in the preparation of plenary meetings. The SFIC Vice-Chair is chairing the Task Force. The General Secretariat of the Council of the EU provides the overall SFIC Secretariat while the EC provides the secretariat for the Task Force. SFIC Plenary meetings take place up to four times a year. The task Force meets in-between. SFIC has biennial work programmes and reports annually to the Council and the EC.

The added value of SFIC

The added value of SFIC is created by optimizing the use of national, European and global resources and avoiding duplication of activities and efforts. In the past years, SFIC has developed activities related to its mandate and objectives and played an essential role in driving forward the EU-MS partnership in international S&T cooperation as well as in contributing to the external dimension of the ERA. Examples are input to the formulation of a European strategy for international STI cooperation as well as input to the Council conclusions on international cooperation.

Development of joint EU/MS-SFIC initiatives – sometimes with associated countries (AC) – on the other hand, has focused on launching cooperations with India, China, USA and Brazil. Developing the India initiative into a political partnership between Europe and India has laid the foundation for the Indo-European partnership on research and innovation. This work has put forward SFIC's work on a strategic research and innovation agenda (SRIA). With China, SFIC has reached the stage of the development of a SRIA as well. Developing the USA initiative has resulted in the roadmap entitled "Approaching USA" with objectives for SFIC to proceed with further work. This initiative has contributed to several events, e.g. the "Destination Europe" information campaign held in the USA. Finally, an initiative has also been launched with Brazil.

Current context and future work

The current SFIC Work Programme 2013-2014 has its focus on four different priorities and areas of action, each one with specific objectives and goals: added value and visibility; common priorities, joint initiatives and actions; analysis, collection and sharing of information; and networking and coordination. SFIC aims

at building on ongoing initiatives, fostering new ones and driving forward the EU/MS partnership.

The goal is to reinforce links to other ERA groups to support the development of the international perspective of the ERA initiatives and new ERA activities. SFIC will take an active role in contributing to the realization of ERA and its international dimension, especially by developing common principles or guidelines for international R&I cooperation, building up synergies with Horizon 2020 and relevant national programmes, and supporting the overall assessment of the impact of the EU's actions in international S&T cooperation.

On 14 September 2012, the EC published its Communication on "Enhancing and focusing EU international cooperation in Research and Innovation: A strategic approach". The EC's rationale for a new strategic approach to international cooperation is that Europe needs to engage more strategically in science, technology and innovation cooperation with its main partners in order to:

- strengthen the Union's excellence and attractiveness in research and innovation and its economic and industrial competitiveness;
- address global societal challenges;
- and support external policies.

While SFIC will provide input to the roll-out of this strategy, the necessary resources and funding for the implementation of the strategy in the ERA context will be provided by Horizon 2020, the EU Framework Programme for Research and Innovation, as well as the relevant national programmes. Contributions will follow the principle of variable geometry, meaning that not all SFIC members have to unanimously support every initiative. Moreover, the Competitiveness Council of 11 December 2012, in its conclusions on "A Reinforced European Research Area Partnership for Excellence and Growth", recalled that the external dimension of the European Research Area is "a vital, cross-cutting and integral part of the ERA and that deepening and strengthening the partnership between the EC and the MS will therefore be an important element of the strategic approach towards enhancing and focusing EU international cooperation in research and innovation". The Competitiveness Council of 31 May 2013, in its

conclusions on "Enhancing and focusing EU international cooperation in Research and Innovation" welcomed all work done by SFIC so far. The Council encouraged the Forum to continue working on its initiatives as well as to focus its work on the contribution to the Horizon 2020 multi-annual roadmaps as well as the development of common principles for international R&I cooperation, as established in the SFIC Work Programme 2013-2014.

Therefore, SFIC has an important task to do: to give policy advice, to look for synergies and possibilities for joint initiatives, as a crucial and beneficial work for all, especially in the current economic situation.



Download

Conclusions on "A Reinforced European Research Area Partnership for Excellence and Growth"

→ http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/intm/134168.pdf

Conclusions on "Enhancing and focusing EU international cooperation in Research and Innovation"

→ www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/intm/137346.pdf

Weitere Informationen

SFIC

→ <http://www.consilium.europa.eu/policies/era/sfic>

→ <http://ec.europa.eu/research/iscp/index.cfm?lg=en&pg=sfic-general>

→ <http://www.internationales-buero.de/de/3483.php>

Ein neues Rahmenkonzept für die internationale Zusammenarbeit in Wissenschaft und Technologie

Die Förderung der Forschungsk Kooperation mit außereuropäischen Partnern war bereits bisher eine Säule der europäischen Forschungsrahmenprogramme (FRP). In der Kooperation mit den europäischen Nachbarstaaten sowie den sich entwickelnden Ländern Asiens, Afrikas und Lateinamerikas hat die EU Maßstäbe gesetzt – so ist sie z. B. der größte externe Drittmittelgeber in den Ländern Afrikas. Bei den Umbrüchen in den post-sozialistischen europäischen Ländern hat die EU-Forschungsförderung entscheidend die erfolgreiche Integration dieser Länder in die globale *Scientific Community* unterstützt.

Das zentrale Instrument der europäischen Forschungsförderung, transnationale Konsortialpartnerschaften prioritär zu fördern, ist ideal, Partner aus Drittstaaten aufzunehmen und damit den Horizont der europäischen Forschung zu öffnen. 21 % der geförderten Vorhaben im 7. FRP hatten mindestens einen internationalen Partner; 120 Millionen Euro wurden für internationale Unterstützungsmaßnahmen (*Support Actions* wie ERA- oder INCO-Nets und BILATs) zur Verfügung gestellt; etwa 2,3 % des 7. FRP-Budgets gingen an internationale Kooperationspartner.

Mit der Kommissionsmitteilung „Verbesserung und Fokussierung der internationalen Zusammenarbeit der EU in Forschung und Innovation: Ein strategischer Ansatz“ wird nun der Rahmen für die internationale Zusammenarbeit neu justiert. Die Mitteilung ist eine von fünf Initiativen zur künftigen Gestaltung des Europäischen Forschungsraums (EFR), zu dessen Implementierung Horizon 2020, das neue Forschungsrahmenprogramm 2014 bis 2020 zur Verfügung steht.

Warum eine neue Strategie?

Exzellenz in der Forschung beruht auf Wettbewerb – Wettbewerb um Forscher sowie Kooperation mit den weltweit Besten. Daraus leiten sich als Grundsätze für die internationale Zusammenarbeit ab, dass der EFR:

- weithin offen sein muss für die Zusammenarbeit mit Wissenschaftlern in der öffentlichen und privaten Forschung weltweit und die dafür erforderlichen Ressourcen erhält;
- seine Kooperation auf strategische Partnerschaften konzentrieren sollte, um die notwendige kritische Masse zu erreichen und zwei Ziele gleichermaßen zu verwirklichen – mit den wissenschaftlich und technologisch fortgeschrittenen Ländern mitzuhalten und mit den sich entwickelnden Ländern gemeinsam Schwerpunkte setzen zu können;
- seine Attraktivität als Partner für Forschungsk Kooperationen weltweit erhöht, u. a. durch exzellente Forschungsinfrastruktur, Intensivierung der Forschermobilität, Förderung der europäischen Spitzenforschung sowie Schaffung geeigneter Rahmenbedingungen für die Verwertung von Wissen und das Setzen von Standards;
- die Zusammenarbeit von Mitgliedstaaten und der Europäischen Kommission verbessert, um seine Interessen kohärent artikulieren und seine Ressourcen optimal einsetzen zu können.

Wie werden Prioritäten thematisch und geographisch gewählt?

Forschungspolitik ist immer eingebettet in die außen- und gesellschaftspolitische europäische Agenda und kann nicht losgelöst von deren Zielen betrachtet werden. Die Prioritäten der Forschungsförderung müssen diesen Kontext reflektieren.

Für die EU steht das Verhältnis zu seinen unmittelbaren Nachbarn im Mittelpunkt. Die Integration der Partnerländer Ost- und Mitteleuropas sowie der Mittelmeeranrainer in den EFR ist für die Forschungspolitik nach wie vor maßgebend. Im 7. FRP ist Russland z. B. das Land mit den meisten Partnerschaften zu EU-Projekten.

Angesichts der Vielzahl der Kooperationsbeziehungen sowohl der EU als auch der Mitgliedsländer zu Drittstaaten ist künftig eine gemeinsame strategische Ausrichtung unabdingbar. Hier sollten Mitgliedstaaten und Kommission über ihre Aktivitäten informieren, zusammen Prioritäten definieren und Methoden ent-

wickeln, sie gemeinsam effektiv umzusetzen. Bisher gehen Förderprogramme von Mitgliedstaaten und EU noch keineswegs Hand in Hand mit der Folge, dass Ressourcen nicht optimal genutzt und Chancen vergeben werden. Angesichts der globalen Herausforderungen ist die Schaffung einer gesunden Balance zwischen Wettbewerb und Kooperation unabdingbar. Die Kooperation mit den fortgeschrittenen Industrieländern sollte sich stärker an den beiderseitigen Interessen orientieren, dabei aber gleichwohl die großen globalen und gesellschaftlichen Herausforderungen nicht aus den Augen verlieren.

Die Zusammenarbeit mit Entwicklungsländern war bisher an den *Millenium Development Goals* ausgerichtet. Forschung und technologische Entwicklung zu Themen wie nachhaltiges Wirtschaften, Klimawandel, Energieversorgung und Infektionskrankheiten sollten gemeinsam mit Partnern in den Entwicklungsländern langfristig angegangen werden und dazu beitragen, die Forschung vor Ort nachhaltig zu stärken. Bi-regionale Dialoge etwa mit den ASEAN-Ländern oder den Mitgliedern der Afrikanischen Union können dabei helfen, die Prioritäten an gemeinsamen strategischen Zielen auszurichten. Die am wenigsten entwickelten Länder sollen darin unterstützt werden, adäquaten Zugang zu geschütztem Wissen zu erhalten.

Welche Instrumente stehen zur Verfügung, die neue Strategie umzusetzen?

Mitgliedstaaten und Kommission haben eine Vielzahl von Instrumenten zur Kooperation mit Drittstaaten entwickelt. Diese reichen von bilateralen Abkommen, Assoziierungsabkommen zu den FRPs bis hin zu gemeinsamen Forschungsprogrammen. Die mit dem 7. FRP etablierten Netzwerke (INCO-NETs, BILAT-Projekte etc.) haben Dialoge über gemeinsame Aktivitäten angestoßen, auf die nun aufgebaut werden kann. Horizont 2020 wird grundsätzlich offen sein, Partnerschaften mit Drittstaaten zu fördern. Forscher in Entwicklungsländern können nach wie vor in die EU-Förderung einbezogen werden, während von Partnern in den industriell fortgeschrittenen Ländern erwartet wird, dass sie sich finanziell selbst beteiligen. Kooperation auf Augenhöhe basierend auf den Grundsätzen gegenseitigen Nutzens, gemeinsamer Zielsetzungen und geteilter Ergebnisverwertung sind die Leitlinien, auf denen die neue Strategie aufbaut.

Koordinierungsinstrumente des spezifischen Programms „Kapazitäten“

Die Stärkung der Exzellenz, Attraktivität und der wirtschaftlichen und industriellen Wettbewerbsfähigkeit sowie die Bewältigung globaler gesellschaftlicher Herausforderungen sind primäre Ziele der FuE-Politik der Europäischen Union. Da gerade globale Herausforderungen über nationale Grenzen hinweggehen, bildet die internationale Kooperation einen wichtigen Baustein und ein übergreifendes Element zur Bewältigung dieser Probleme. Zur Förderung der europäischen sowie internationalen Kooperation gibt es daher im Rahmen des spezifischen Programms „Kapazitäten“ u. a. drei Koordinierungsinstrumente, die wichtige, flexible Instrumente zur Förderung der Forschungs- und Innovationspartnerschaften mit Drittregionen bzw. -ländern sind.

INCO-NETs dienen der Unterstützung des politischen Dialogs sowie der Festlegung gemeinsamer wissenschaftlicher FuE-Prioritäten zwischen der EU und einer weiteren Drittregion. Vertiefte Analysen, Monitoring sowie strategische Pilotaktivitäten mit der Region werden mit dem Ziel einer stärkeren internationalen Vernetzung und Partnerschaft durchgeführt.

BILAT-Projekte vertiefen im Gegensatz zu den INCO-NETs den forschungspolitischen Dialog zwischen der EU und einem Drittstaat. Die EU verfügt dabei immer über ein WTZ-Abkommen (S&T-Agreement) mit diesem Zielland. Ziele der Maßnahmen sind die reziproke Öffnung von Förderprogrammen, die Steigerung der Anzahl internationaler Wissenschaftler/-innen am jeweils anderen Forschungsförderprogramm, die Ermöglichung bilateraler Kooperationen durch die Zusammenbringung von Forschenden (z. B. durch Workshops) sowie die Sondierung von Hemmnissen bei der FuE-Kooperation. Viele Projekte unterstützen seit dem Arbeitsprogramm 2012 die verschiedenen SFIC-Länderinitiativen (vgl. S. 47 ff.).

ERA-NETs verfolgen das Ziel, die Zusammenarbeit von europäischen und internationalen Programmträgern zu verbessern und nationale Forschungstätigkeiten insgesamt besser aufeinander abzustimmen. Um die nationalen Förderaktivitäten auf europäischer Ebene stärker miteinander zu vernetzen, werden im Rahmen eines ERA-NETs gemeinsame Ausschreibungen durchgeführt. ERA-NET-Mittel werden von den nationalen Ministerien bereitgestellt. Internationale ERA-NETs setzen Ausschreibungen mit einem spezifischen Partnerland bzw. einer Partnerregion außerhalb Europas um. Die Ausschreibungsthemen werden vom Projektkonsortium und in Abstimmung mit der Kommission beschlossen. In Deutschland läuft die Beteiligung an einem ERA-NET meist über die Projektträger.

Horizont 2020 wird sich als neues Rahmenprogramm für Forschung und Innovation ab 2014 an das 7. Forschungsrahmenprogramm anschließen. Künftig sind die oben genannten Projekte unter der sechsten Herausforderung („Challenge“) unter dem Titel „Integrative, innovative und reflexive Gesellschaften“ verankert und heißen „spezifische horizontale Maßnahmen zur Förderung der internationalen Zusammenarbeit“.

Was sind die nächsten Schritte?

Rat, Mitgliedstaaten und Kommission stimmen darin überein, ihre Forschungspolitik an den gemeinsamen Zielen auszurichten. Internationale Zusammenarbeit erfordert eine enge Kooperation von Mitgliedstaaten und Kommission. Diese Partnerschaft strategisch auszurichten und dabei bestehende institutionelle Settings (z. B. das Strategic Forum for International S&T Cooperation) zu nutzen, ist der Leitfaden, an dem sich die Mitteilung orientiert. Dabei kommt dem Europäischen Rat die Aufgabe zu, den Fortschritt im Hinblick auf die Öffnung des EFR und die strategische Zielsetzung zu beobachten, zu bewerten und darüber zu berichten. Die Kommission hat zur Unterstützung dieses Prozesses den Monitoring-Prozess etabliert.



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Weitere Informationen

Europäische Kommission – Mitteilung zur internationalen Zusammenarbeit in Forschung und Innovation

→ http://www.euburo.de/international-aktuelles_mitteilung_kom_14092012.htm

EU Cohesion Policy 2014-2020 and the Specific Focus on Research and Innovation: Interview with D. Corpakis

The purpose of cohesion policy as defined in the EU treaties is to reduce the often alarming economic disparities among European regions. It was thus only natural that, in the past, local authorities gave priority to infrastructure projects that could transform the basic conditions for their economies to develop (for example, improving networks for utilities such as water management, energy, transport and telecommunications). However, the world has changed, and catering for infrastructure alone is no longer enough for any region to gain a competitive advantage.

ITB: In public perception cohesion policy is often associated with infrastructure projects. In the next funding period, however, one focus will be on the strengthening of research and innovation.

Why has this target become so important?

Dimitri Corpakis: Globalisation has moved the frontiers on production and processes and made knowledge, talent and skills the primary ingredients for competitiveness and growth. The innovative capacity of nations and regions now defines their economic profile and their level of prosperity. Technological advance and proficiency have become essential.

Therefore we cannot continue doing regional policy as we did 15 years ago: we need to stimulate the new drivers of regional development, which are research and innovation (R&I). This is why R&I have such an important place in the next programming period (2014-2020) of the European Structural and Investment Funds (ESIF). However, Member States (MS) and regions must think hard in advance about how best they can use the funding available. Through so-called Research and Innovation Strategies for Smart Specialisation (RIS3) they have to



make sure that they develop and follow a strategy for economic development that is firmly rooted in local knowledge and builds comparative advantage based on the unique assets of the MS/region concerned. RIS3 is therefore a bottom-up planning process that requires the full involvement of all economic actors, including local businesses or prospective foreign investors. In this way the identification of real opportunities for a region will be tested and debated before embarking on the strategy. The so-called “entrepreneurial process of discovery” will be central for success.

ITB: How did Cohesion Policy funding for research and development (R&D) and innovation develop over the past years and what share of cohesion policy funding is expected to be spent on R&D in the years 2014-2020?

Dimitri Corpakis: At the beginning of the 1990s, cohesion policy funding for R&D and innovation was quite limited; if it happened at all, it was largely confined to infrastructure investments, such as university labs or science parks.

However, this began to change in the mid-1990s with the development of the first Regional Innovation Strategies and Regional Innovation and Technology Transfer Strategies, etc. At the initiative of the European Parliament, we also launched the pilot action called “Regions of Knowledge” that developed into a full-fledged activity in the 7th Framework Programme (FP7). This focused on the concept of transnational collaboration of research intensive regional clusters and developed over its seven years an important community of learning regions. This was accompanied with its “sister” activity under the “Capacities” part of the FP7: “Unlocking the Research Potential of convergence and outermost regions of the EU”. These two actions together stressed the importance of research and innovation as an element of local development in an international context, and the significance of the role that universities and other research institutions play in regional economic development.

The growing awareness of the importance of research and innovation for regional economic growth and job creation has been reflected in the share of funding for R&I in the evolving budget of the Structural Funds: starting from a mere 4 % at the start of the 1990s, it has now reached almost 25 %. The objective for the new programming period (2014-20) is to reach and go over 30 % of the total.

There is no formal pre-identification of the share for R&I total direct investment in the context of ESIF, but regions have to concentrate part of their funding on four thematic objectives, including support for research and innovation (the others are SME competitiveness, information and communication technologies (ICT) and support for the low carbon economy). In the case of developed and transition regions, up to 80 % of their total European Regional Development Fund allocation must go towards these objectives; less developed ones must do the same, but at the level of 50 %. This means regions will have to be much more attentive to their strategies for innovation, research, the environment and the take-up of ICT. RIS3 will be instrumental on these aspects.

ITB: You have a broad overview over what is happening in Europe. Could you give us an idea of how the regions promote research and innovation? What are the topics? And what are the instruments? Are there any region specific models?

Dimitri Corpakis: Member States and regions are currently preparing their RIS3 strategies, which as stated are a pre-condition for approval of the Operational Programmes for the ESIF. They are using a variety of tools.

A concrete example is Flanders in Belgium, as analysed recently in an OECD study on Smart Specialisation. What is relevant here is the approach adopted by the policy makers, who decided to first analyse potentially relevant R&I domains and then validate the findings through consulting relevant actors. Such a process is likely to lead to the development of R&I policies that are evidence and place based, with a significant potential for economic impact on the ground. A place-based approach stresses also the importance of maximising both intra- and inter-regional knowledge spill-overs in the relevant domains and across the business and the scientific communities.

ITB: What are the differences, what the commonalities between Cohesion Policy focusing on research and innovation and Horizon 2020, the EU Framework Programme for Research and Innovation?

Dimitri Corpakis: In financial terms, European Structural and Investment Funds are distributed on the basis of pre-allocated global amounts to Member States and regions, which manage them through dedicated structures (Managing

Authorities), set up at regional and national level (for national or regional projects). The funding is implemented through a series of Operational Programmes drafted by regional and national authorities that describe the investment priorities defined on the basis of in depth socio-economic analyses. Research and innovation is just one of the thematic domains of intervention for the next programming period (2014-2020). In contrast, funding for Horizon 2020, the EU's future research and innovation framework programme, is centrally managed by the European Commission and allocated through open and competitive calls to transnational consortia. Both contribute to our common objective of supporting smart, sustainable and inclusive growth, but in different ways.

In the past we have seen a lot of investment initiatives on research and innovation without a clear purpose and thus with limited effectiveness on the ground. Implementing RIS3 will not remove support for capacity building or more conventional support for research and innovation. It will give however a new direction and focus on the whole exercise of cohesion policy support to research and innovation measures that will be now integrated in a meaningful overall strategy.

ITB: The regions are asked to use synergies between the different EU programmes in order to increase the effect of EU funding. Where is the specific potential for synergies?

Dimitri Corpakis: Synergy is a Greek word meaning that a complex result can be achieved by combining efforts which are distinct but at the same time interrelated. This is why EU programmes are designed to contribute in a complementary way to implement the Europe 2020 strategy for smart, sustainable and inclusive growth. While each aims to address specific issues, taken together the programmes should be mutually supportive.

As an example, we could have a pre-commercial procurement of tele-care equipment which is launched by a regional authority using cohesion funds complemented by a Horizon 2020 project aimed at strengthening research in that specific innovation domain. Obviously access to Horizon 2020 will require the participation in a competitive call and success is not guaranteed for any company or university, since competition is very high. However, the message is that a combined use of the different funding sources can contribute to more effective

interventions and maximise the added value on the ground. For example, a university which is successfully participating in a Horizon 2020 funded project (and thus forms part of an international consortium), can be further supported (for additional activities in the same project) by the local Operational Programme, if this OP has foreseen support of this kind. However, care should be taken of not funding the same kind of expenditure twice (once by the ESIF and then by Horizon 2020).

Already in the current programming period (2007-2013) there have been several virtuous examples of combination of funding sources where the upgrading or research infrastructure would be funded by the Structural Funds and a series of integrated activities to increase research capacity. A country like Poland has seen several good examples of this kind (in particular projects that had been initially supported by Research Potential (active through staff exchanges with other research institutions, recruitment of experienced researchers, equipment upgrades and conferences) had been reinforced by additional research infrastructure investments, funded by the national/regional authorities supported by the ESIF.

Other common cases are those in which R&I activities have been funded by the MS/regions and supported by the Structural Funds while at the same time the same stakeholders engaged in research and innovation strategies (increasing their transnational connectivity and knowledge exchange) through the FP7 action on Regions of Knowledge under the well-known model of Triple Helix (collaboration between industry, academia and local government).

In the future programming period such combination of funding will be possible even for the same project, however for different project components. A guide on "Synergies between ESIF and Horizon 2020" is currently in preparation by the European Commission services and should enter into force in 2014.

ITB: Let's have a brief look into the future: Where do you see research and innovation in the European regions in the year 2020?

Dimitri Corpakis: In an open global economy, competitiveness lies in the capacity of businesses to create high value-added goods and services. Research and

innovation are central to the achievement of this goal. Strategic intelligence, value chain analysis, foresight exercise are some of the tools currently used by national and regional policy makers to identify the high value-added activities which offer the best chance for strengthening the competitiveness of European regions.

Turning now to our flagship programme for research and innovation at European level for the next programming period, Horizon 2020, we can safely say that it will make an important difference for stimulating ground breaking research and igniting innovation at national and regional level. Horizon 2020 is a radically simplified framework programme with a substantially increased budget (a little over 70 billion euros) that will open new opportunities, especially for small and medium size companies (SMEs), thus favouring players at regional level. Horizon 2020 is also challenge-driven, less prescriptive and by far more innovative than its predecessors. With its three pillars Horizon 2020 will strengthen the EU's position in science, will deal with industrial leadership in innovation with major investment in key technologies, greater access to capital and support for SMEs.

Horizon 2020 will provide funding to help address major concerns shared by all Europeans such as climate change, developing sustainable transport and mobility, making renewable energy more affordable, ensuring food safety and security, or coping with the challenge of an ageing population. The approach chosen for tackling societal challenges will contribute to bridge the gap between research and the market, for example by helping innovative enterprises develop their technological breakthroughs into viable products with real commercial potential. This market-driven approach will include creating partnerships with the private sector and Member States to bring together the desired results.

At the same time, specific measures in Horizon 2020 will help spreading excellence and widening participation in future research and innovation activities. A consistent set of actions will stimulate this important objective. The Teaming and Twinning Actions will create new Centres of Excellence and expertise, and encourage pan-European networking between researchers with a strong focus on excellence and innovation. They will facilitate knowledge transfer and the exchange of best practice between research institutions, building on the strengths

of leading partners. The ERA Chairs scheme will bring outstanding researchers to universities and research institutions that have a high potential for research excellence. The Institutions that will participate in these actions should also be able to mobilise funding from different funding sources, including from the ESIF.

Completing also the European Strategic Forum for Research Infrastructure Roadmap, could also equip European countries and regions with the necessary science and technology powerhouses that may have a dramatic effect on national and local economies. However this will crucially depend on the overall framework conditions for innovation that would be deployed by the national and regional communities. That could be key for future regional development.

Together with Horizon 2020, regions have to seize the major opportunity of the fully revamped and modernised Cohesion policy, to make the most of European funding for research and innovation and turn knowledge into competitive advantage. The Commission's effort on introducing the concept of Smart Specialisation will certainly bear its fruits, through a collective, collegial effort by all Europeans, for growth and jobs.

Die Fragen an Dimitri Corpakis stellte

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Weitere Informationen

EU Commission – DG Research and Innovation – Regional Dimension of Innovation

→ http://ec.europa.eu/research/regions/index_en.cfm?pg=contacts&lg=en

Europe 2020

→ http://ec.europa.eu/europe2020/index_en.htm

Research and Innovation Strategies for Smart Specialisation (RIS3)

→ <http://s3platform.jrc.ec.europa.eu/home>

Guide on Research and Innovation Strategies for Smart Specialisation (RIS3 Guide)

→ <http://s3platform.jrc.ec.europa.eu/de/s3pguide>

Horizon 2020

→ http://ec.europa.eu/research/horizon2020/index_en.cfm

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