アジアにおける科学技術連携に関する政策提言
中間報告

2013 年 3 月 27 日

国際政策対話 2012 参加者一同

一般財団法人武田計測先端知財団

Strategic Funds for the Promotion of
Science and Technology

2013 年 3 月 27 日
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背景と目的

我々は、武田計測先端知財団が 2012 年 10 月 19,20 日の両日、政策研究大学院大学で開催した国際政策対話 2012 の参加者である。2 年前の 2011 年、武田計測先端知財団は、アジアの科学技術コミュニティ、政府関係機関、民間営利・非営利部門の代表者を招へいして、アジアにおける科学技術の域内連携に関する最初の国際政策対話(国際政策対話 2011)を開催した。国際政策対話 2011 では、アジア域内における頭脳循環を目指す域内共同人材開発、域内共同研究と研究インフラの共同使用のような域内の科学技術連携の様々なテーマについて議論が行なわれた。議論の中から、参加者は、以下のような課題を抽出した。

1) BOP を含む社会の底辺の人々を経済成長の活動に参加させるため、水問題、公衆衛生、交通インフラのような基本的課題を解決すべきこと
2) 域内における共同人材開発を促進するため、国境を越えて人材移動を促進すべきこと
3) 域内共同研究を推進するために国境をこえた資金提供が可能なメカニズムを構築すべきこと
4) イノベーションを目指す域内共同研究の場として、国際オープン・イノベーション・リサーチ・センターを創設すべきこと

2012 年 10 月 19,20 日に開催された国際政策対話 2012 において、これら諸課題について検討した結果、イノベーションを促進し、アジア域内の持続的成長を確保するためには、これら諸課題について具体的に対処することが必要であるとの認識に達し、課題の解決についての政策提言書をアジア各国の政府、科学技術コミュニティ、民間営利・非営利部門の関連機関に提出することを決定した。

なお、我々、国際政策対話 2012 の参加者は、個人として政策対話に参加し、提言の内容に賛同するものであり、我々の意見は、所属機関を代表するものではない。

政策提言 1
国境を越えた人材移動の促進

グローバル化の進展に伴い、情報や製品の国境をこえた移動は大幅に加速されたが、人の移動は、情報や製品の移動ほど加速されなかった。ASEAN は、2015 年には経済統合を果たし、圏内における人・物・金の移動を自由化しようとしている。現在は、ミャンマー、ラオス、カンボジアを除いた ASEAN 7 カ国では人々はビザなしで圏内を移動できる。ASEAN の統合計画は、ビザ免除の取決めを圏内全体に拡大し、経済成長を更に加速しようというものである。ASEAN 圏内の人の移動を加速する計画はあるものの、ASEAN

圏内と圏外との人の移動を加速しようという動きはまだない。 アジアが持続可能な成長を達成するには、少なくともアジアにおいて人の移動を自由化する必要がある。我々は、アジア圏内における人の移動を促進するため、以下の提案を行なう。

(1) 2015 年の ASEAN 経済統合までに、ASEAN 圏内と圏外の人材移動を促進する域内取決めをアジア各国で締結する。その場合、APEC ビジネス・カードやマルチ・エントリー・ビザのような取決めの拡張も含めて検討する。

(2) 人材には、大学や研究機関の研究者だけでなく、中小企業、非営利組織、地方政府、地域の共同体からの専門家を含める。

(3) 人の移動を促進するため、公的機関や民間財団のネットワークを構築し、移動を支援するプログラムを構築する。その場合、海外で働いている自国の研究者や専門家の帰国を促すプログラム構築も考慮する。人材移動を促進する場合、優先分野を設け、ステップ・バイ・ステップに実施することが望ましい。

(4) 海外で働く、あるいは勉強をしている研究者、専門家、学生のネットワーク(Diaspora Network)を構築し、頭脳流出の流れを頭脳循環に転換する。

政策提言　2

域内のイノベーションを支援する新しい資金提供システム(funding system)の構築

グローバル化の進展に伴い、国家間の競争が激化し、各国は国際競争力を向上させるため、国家イノベーション・システム(National Innovation System)を構築することに専念してきた。しかし、自国の競争力のみを向上させるために構築された国家イノベーション・システムは、域内にまたがる、あるいは地球規模の課題に対応するには有効なシステムではない。現在の国家イノベーション・システムを地球規模のイノベーションに対応できるようなシステムに拡張する必要がある。現在の科学技術のプレイヤーは、政府の機関や大学だけでなく、地方政府や民間営利・非営利部門の研究者を含み、多様化している。今こそ、伝統的な研究支援体制を見直して、域内や地球規模の科学技術連携を支援できる新しい研究支援システムを再設計する時期であり、我々、国際政策対話 2012 の参加者は以下の方策を提言する。

(1) アジア共通の課題に対処する国際共同研究を支援するため、アジア内外の政府及び民間部門から資金を調達して国際的な研究財団を設立する。この国際的な研究財団は、特定の国の利益に縛られることなく、独立的でなければならない。また、新しい支援プログラムは、研究支援を続ける中で成長できるような柔軟性が必要であり、基礎研究から開発研究に至る様々なレベルの研究や、多様な分野の研究を支援するとともに、次世代の研究者や技術者の育成も支援する必要がある。

(2) 新しい研究財団が設立されるには時間がかかることから、その間、既存の公的資金配分機関や民間財団のネットワークを構築し、イノベーションに繋がるような域内の共同研究を支援する。国際的な研究支援を行なっている機関及びプログラムには

以下のようなものがある：ASEAN 財団；TEMASEK 財団； ヒューマン・フロンティア・サイエンス・プログラム(HFSP, Human Frontier Science Program)； 科学技術振興機構(地球規模課題対応国際科学技術協力プログラム(SATREPS)、e-ASIA 共同研究プログラム(e-ASIA JRP))； アジア開発銀行； ビル・ゲイツ財団(Bill & Melinda Gates Foundation)

政策提言 3

アジアにおける国際オープン・イノベーション・リサーチ・センターの設立

科学技術は、新しい社会的、経済的価値を創出するイノベーションの原動力である。グローバル化が進展し、地球規模の課題が複雑化し、科学技術の領域が融合しつつある今日、もはや、内向きで閉鎖的な研究開発は十分ではない。このような状況下で、科学技術研究における国際的な産官学連携が益々重要になっている。欧米では、米国の SUNY Albany やフランスの MINATEC、ベルギーの IMEC のような産官学連携による大規模なオープン・イノベーション・センターが設立され、多くの国の民間や公的部門の研究者が先端的な施設や実験設備を共同使用して共同研究を行っている。また、研究だけでなく、人材開発やネットワークの構築・拡大も共同で実施している。このような大規模な産官学連携のオープン・イノベーション・センターは、アジアにはまだない。今後、アジアが世界の科学技術を牽引すべきことを考えると、アジアの先進国と途上国が共同して産官学連携によるオープン・イノベーション・センターを設立することが必要であると思われる。今こそ、アジアに各国の研究者が自由に参加して共同研究を実施することが可能なオープン・イノベーション・センターを設立し、域内共通課題に対処し、持続可能な経済成長の礎を築く時である。 アジアには豊富な人材と、多様な文化、知識があり、これらを活用し、頭脳流出を頭脳循環に転換するために、アジアに複数のオープン・イノベーション・センターを設立することが必要である。この観点から、我々、国際務政策対話参加者は、以下の提案を行う。

(1) アジア域内の共通課題に対処するため、産官学連携による複数の国際オープン・イノベーション・リサーチ・センターを設立する。

(2) 最初の試みとして、ASEAN に再生エネルギー、特にバイオマスについて研究開発を行う国際オープン・イノベーション・リサーチ・センターを設立する。東南アジアは、バイオマスの賦存量が豊富であり、東南アジアの多くの国が再生エネルギー、特にバイオマスの開発・利用を国策としている。バイオマス開発技術については、日本に一日の長があり、日本にとってはバイオマスの原料地における日本の技術の普及と標準化が可能である。また、東南アジアには、多くの日本の自動車企業が進出しており、日本の技術によるバイオマス燃料の標準化は日本企業のアジア展開を後押しするものになる。

(3) 国際オープン・イノベーション・リサーチ・センターの立上げを容易にするた

めに、初めは、既存の研究設備と SATREPS や e-ASIA JRP のような国際共同研究プログラムの利用を考慮する。

(4) 日本を含むアジアにおけるバイオマス研究のネットワークを構築し、タイ、インドネシアやベトナムのような参加各国に共同研究を行うハブを設ける。

(5) 学術界と産業の両方に役立つような創造的なプロジェクトを開発し、産官学の研究者の共同研究を促す。共同プロジェクトは、研究費を双方が負担するマッチング・ファンド方式によって支援される。

以上

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APPENDIX 1

EXECUTIVE SUMMARY
CROSS-BORDER MOVEMENT OF HUMAN RESOURCES

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I World Trends

Cross-border movement of researchers has been accelerated as open innovation and the globalization progress. The cross-border movement of students also has been accelerated, and the largest source of the studying abroad students is Asia. Current trends of the cross-border movement of students has changed from the pattern that Asia-Oceania students mainly move to developed countries such as the US and Europe.

(i) Currently, the regional movement within Asia is expanded, especially among Japan-China-Korea and between China and ASEAN (especially between China and ASEAN 3 countries including Singapore, Malaysia and Thailand), while the movement from Asia-Oceania to the western countries (especially English speaking countries) is also expanded.

(ii) The movement from Middle East and African countries to Asia is also expanded.

(iii) Ninety percent of the moving students are privately funded, and they choose targeting countries based on their own strategies and favors.

II Policy Measures

Many countries including newly developing countries adopt policy measures to attract highly talented human resources and improve research environment in order to create innovation based on science and technology. Especially these countries focus on attracting top-leveled researchers as well as post-doctoral researchers. They also adopt policy measures to assist returning of working abroad researchers such as “Backing Australia’s Ability (Australia), and the International Reintegration Grants and European Reintegration Grants of the Marie Curie Program of EU. In Asia, China and Thailand as well as Korea develop new research posts and improve research environment to call back working abroad researchers.

III Regional measures

Countries and universities of the Asia-Pacific Area have developed an international voluntary association named UMAP (University Mobility in Asia and Pacific) which aims to facilitate the free movement of students in the region. Although UMAP focuses the movement of undergraduate students, they plan to extend the current program to the movement of young researchers. UMAP members include Australia, Brunei, Cambodia, Canada, Chile, China, Ecuador, Fiji, Guam, Hong Kong, Indonesia, Japan, Korea, Macao, Malaysia, Mexico, Mongolia, Myanmar, New Zealand, Papua New Guinea, Peru, Singapore, Taiwan, Thailand, Timor, the US, and Vietnam.

There is an agreement between APEC countries for the purposes of recognizing “substantial equivalence” of professional competence in engineering. It is called APEC Engineer Agreement. APEC countries can apply to become members of the agreement by demonstrating that they have systems which allow the competence of engineers to be assessed to the agreed international standard set by the APEC Engineer agreement. Approved engineers can freely travel within the region without applying for visa. APEC Engineer program is an extension of APEC Business Travel Card (ABTC) which allows registered business men to freely travel on business within the region. In 2000, seven APEC countries and economy including Japan, Australia, Canada, Hong Kong, Korea, Malaysia, and New Zealand became members of the APEC Engineer program. Later, another seven countries and economy joined the program. They are Indonesia, the Philippines, the US, Thailand, Singapore, Chinese Taipei, and Russia.

ASEAN plans to accomplish economic integration by 2015 which aims to facilitate free movement of goods, services, and people within the region. At present, people from 7 countries except Myanmar, Laos, and Cambodia can visit each other without applying for visa. In 2015, they plan to extend the current visa waiver arrangement to the whole region, and try to establish regional visa for visitors from outside ASEAN.

EU has developed several exchange programs that facilitate international exchange of students and researchers within the region, which include ERASMUS (European Community Action Scheme for the Mobility of University Students) Program, Marie Curie Action, and NORDFORSK Program. Especially, Marie Curies Action provides various sub-programs including short and long term exchange of students and researchers, calling back of working abroad researchers, and promotion of employment. In 2009, EU established the Blue Card system. The Blue Card is an approved EU-wide work permit which allows high-skilled non-EU citizens to work and live in any country within the region except Denmark, Ireland and the United Kingdom.The Blue Card offers a one-track procedure for non-EU citizens to apply for a work permit, which would be valid for up to two-years.

IV Challenges

While ASEAN will free the movement of human resources within the region by 2015 as a result of economic integration, there seems to be no significant actions toward the free movement of human resources between ASEAN and outside ASEAN. It will be necessary to facilitate the cross-border movement of human resources at least within the East Asian region. APEC Engineer program is a very important program bridging Asia and Pacific and can be extended to the East Asia. However their requirements for qualification are too high to facilitate the free movement of human resources.

Although there are some international exchange programs for students, there is no such programs for researchers.

V Proposal

(i) Establish regional arrangement to facilitate the cross-border movement of human resources between SEAN and outside ASEAN (East Asia) by 2015 when ASEAN will accomplish economic integration.

(ii) APEC Engineer program should be extended to general researchers including post-doctoral researchers, and the membership should be extended to the East Asia region.

(iii) Establish programs to support the movement of human resources by developing networks among public funding agencies and private foundations.

APPENDIX 2

October 19, 2012

Cross-Borders Funding Mechanisms

Osamu Kobayashi
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In the “International Policy Dialogue on Regional Collaboration in Science and Technology in Asia 2012 (IPDCSTA2012)” to be held between 19th and 20th of October 2012 in Tokyo, the topic how to develop novel funding mechanisms for facilitating regional collaborative researches will be one of the main discussion points. Some examples of the funding mechanisms to be provided here would be some help of the discussion as reference materials. All of them can support regional collaborative researches/activities according to their own objectives regardless of national boundaries.

Namely,

1. **ASEAN Foundation**
2. **TEMASEK Foundation**
3. **EU Framework Programme 7 (FP7)**
4. **Human Frontier Science Program (HFSP)**
5. **Drugs for Neglected Diseases initiatives (DNDi)**

I would like to introduce these organizations basically from the points of;
1. Background Outline and Purpose of Establishment
2. Funding Programmes
3. Donors
4. Recipients

I. ASEAN Foundation (NPO)

1. Background Outline and Purpose of Establishment

(1) Outline:

In recognition of the fundamental importance of improving the livelihoods and well-being of the peoples of Southeast Asia, the ASEAN Foundation was established by the

ASEAN Leaders in 1997 in Kuala Lumpur to help bring about shared prosperity and a sustainable future to all 10 ASEAN Member Countries, namely, Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Viet Nam.

On the same day, the ASEAN Leaders reaffirmed their commitment to this purpose with the ASEAN Vision 2020 which foresees “ASEAN as a concert of Southeast Asian nations, outward looking, living in peace, stability and prosperity, bonded together in partnership in dynamic development and in a community of caring societies, as well as a community conscious of its history, aware of its cultural heritage and bound by a common regional identity." The ASEAN Vision 2020 also stipulated to “use the ASEAN Foundation as one of the instruments to address issues of unequal economic development, poverty and socio-economic disparities.”

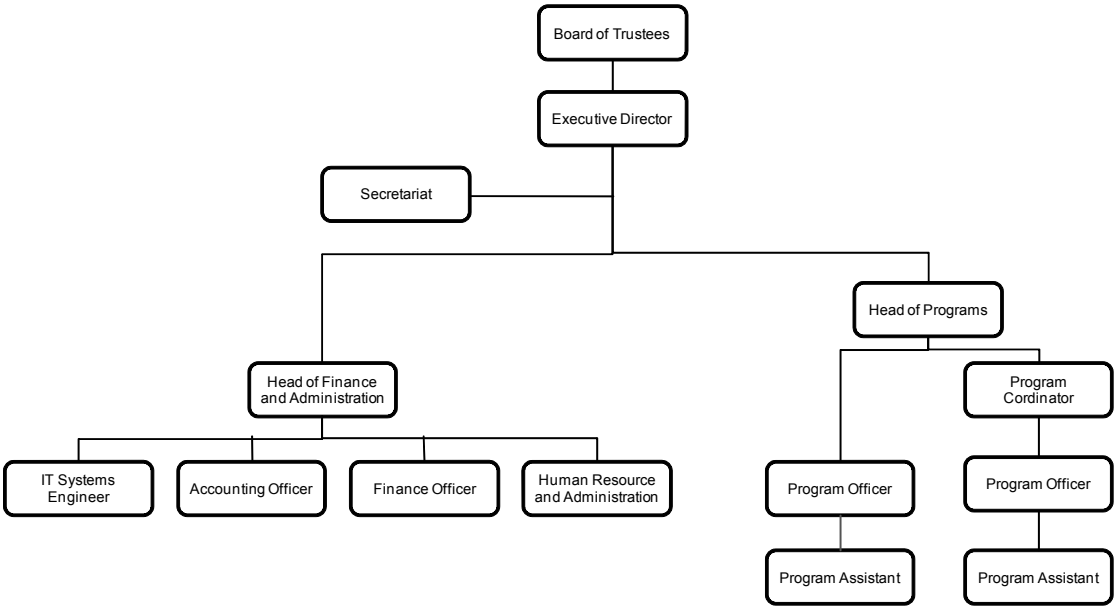
The ASEAN foundation is mandated to undertake a two-fold mission:

- to promote greater awareness of ASEAN, and greater interaction among the peoples of ASEAN as well as their wider participation in ASEAN’s activities inter alia through human resources development that will enable them to realize their full potential and capacity to contribute to progress of ASEAN Member States as productive and responsible members of the society.
- to endeavor to contribute to the evolution of a development cooperation strategy that promotes mutual assistance, equitable economic development, and the alleviation of poverty.

(2) Organization:

The headquarters of the Foundation shall be in the Republic of Indonesia (stipulated in ARTICLE II of ASEAN Foundation MoU) The Host Country (Indonesia) shall extend to the Foundation, the Executive Director and the Staff who hold diplomatic status such privileges and immunities as may be necessary for the performance of their duties.

- Organization Chart of ASEAN Foundation (as of May 2009)-



The Board of Trustees is made up of one representative each from the ASEAN Member Countries, along with the Secretary-General of ASEAN, and the Executive Director, both as ex-officio members. The Board of Trustees formulates the guidelines and procedures for all the activities of the Foundation, has responsible for the Fund of the Foundation, approves all projects seeking support from the Fund of the Foundation; and approves the annual operational budget.

2. Funding Programmes

(1)Outline:

In view of the fact that industries and economies of the future will more and more be dependent on human skills and knowledge, the ASEAN Foundation deems that the most beneficial and effective means to attain its objectives would be by focusing on human resources development activities or projects such as education, training, seminars, workshops, exchanges, network-building, fellowships and information dissemination.

To accomplish its objectives, the ASEAN Foundation carries out a range of activities that help solve urgent regional problems, including to:

1. organize and support activities to promote education, training (including in the areas of science and technology), health and cultural life;

2. provide assistance to uplift the social condition of the peoples in the ASEAN Member States;
3. provide fellowships to and support exchanges of ASEAN youths and students;
4. promote collaborative work among academics, professionals and scientists;
5. implement projects assigned by ASEAN Leaders or Ministers
(partially quoted from ARTICLE V of MoU)

(2)Project Examples:

1) Promoting ASEAN Awareness

“Enhancing Youth Awareness through Information Technology”（Project No. 099）
Implementing Agency: ASEAN Foundation and DLSU-CREM, Philippines

2) Interaction Among ASEAN Stakeholder

“7th ASEAN Science & Technology Week: participation of ASEAN Scientist at the 2nd ASEAN Science Congress and Sub-Committee Conference”（Project No. 082）
Implementing Agency: Indonesia State Ministry of Research and Technology of the Republic of Indonesia

3) Developing Human Resources

“Human Resource Development in Geographic Information System and Remote Sensing for the Forestry Personnel of ASEAN Countries”（Project No. 101）
Implementing Agency: Forestry Department, Malaysia (FDPM), Malaysia

4) Reduce Poverty

Communication Information System for the Control of Avian Influenza in Lao PDR and Viet Nam (CISCAI)（Project No. 111）
Implementing Agency: ASEAN Foundation Secretariat

3. Donors

The Fund of the Foundation shall come from the contributions, including that of ASEAN Member States, private corporations and other foundations or individuals[1].（ARTICLE VII 3 of MoU）

Funding from ASEAN governments currently totals US$ 4.3 million. Funds remitted by Brunei Darussalam, Indonesia, Malaysia and Singapore, have been earmarked for the Foundation's Endowment Fund, while those from the remaining countries have been

allocated for operational expenses. A major source of funding contribution came from Japan (referred to as the Japan - ASEAN Solidarity Fund). Additional contributions have come from the governments of China, Korea, and France and IDRC of Canada, as well as Microsoft Corporation and Hewlett-Packard.

(1)ASEAN member countries:
(2)Other supporting countries and donors:
1) Japan (Japan-ASEAN Solidarity Fund): USD 20 million in1999
2) The People's Republic of China: USD 200,000 in 1999
3) Republic of Korea: USD 200,000 in 1999
4) International Development Research Centre (IDRC), Canada: approx. USD 150,000 (in kind mainly computer hardware), CAD800,000 (approximately USD 513,000) in 2003 & USD 60,000 in 2005
5) France: € 33,000 in 2004 and € 30,000 for project-basis
6) Microsoft Corporation: USD 39,500 in 2005.
7) Hewlett-Packard

Contributions made to the Foundation shall be paid into any of the Endowment Account, Operational Account or the Projects Account, as specified by the donors. If unspecified by the donors, the contributions shall be paid into the Endowment Account.（ARTICLE VII 4 of MoU）

4. Recipients

Academic, cultural, economic, social and other relevant government institutions and bona fide non-governmental organizations of ASEAN member countries shall be eligible for assistance from the Foundation in conformity with its stated objectives.（partially quoted ARTICLE VI of MoU）

II. TEMASEK Foundation (NPO)

1. Background Outline and Purpose of Establishment

Temasek Foundation (TF) is a Singapore philanthropic organization set up by “Temasek Holdings”[1] to build a more prosperous, stable and connected Asia through developing human and social capital. Temasek Holdings has committed over S$1 billion for community, philanthropic and public good causes. Of this, S$500 million was endowed to the Temasek Trust in May 2007 for TF.

Working with expertise institutions from Singapore and the region, TF supports training programmes in health care, education, public administration and disaster-preparedness and programmes that promote positive networks of cooperation in and across communities in Asia.

TF has committed almost S$100 million over the last five years to support 139 programmes in 17 countries in Asia, and Rwanda.

Purpose and Mission of TF are to contribute to a bright future of hope and opportunities for people in a connected and prosperous Asia by:

- Developing People through Health Care, Education and Research;
- Building Bridges between peoples;
- Building Institutions of Excellence through Governance and Ethics; and
- Rebuilding Lives and Livelihoods affected by Natural Disasters

As an organization anchored in Singapore, TF's work is mainly focused in Asia. The programmes span all corners of a bustling and vibrant Asia, filled with opportunities for greater cooperation, learning and networking. Through the programmes, TF contributes towards a more thriving and prosperous Asia.

2. Funding Programmes

(1)Prioritized Areas:

- Developing People : Health Care
  Community Health and Clinical Care Management
  Dealing with public health issues to raise standards of community care
- Developing People : Education
  Technical and Vocational Education and Training
  Enhancing the capabilities of the skilled workforce to be more employable and relevant in meeting the needs of the industry
- Building Bridges
  Student Leaders Exchange Programmes
  Learning cuts across all cultures and these students embody the true spirit of learning
- Building Institutions

Public-Private Partnership Frameworks

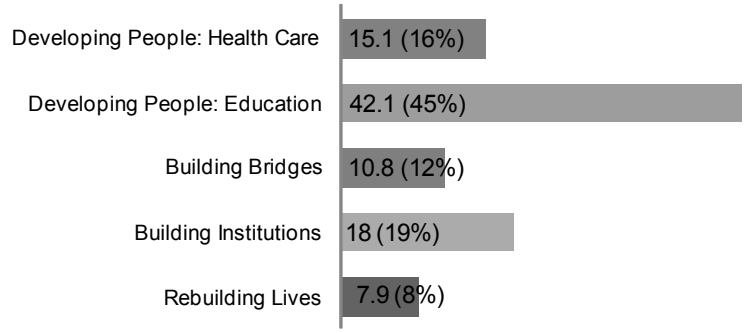
Empowering public institutions to develop governance frameworks for public-private partnerships

- Rebuilding Lives Post-disasters

  Wall-Strengthening Techniques for Seismic-Prone Regions

  Helping communities in seismic-prone regions to strengthen their buildings

Overview of Total Foundation Grants (May 2007 - Dec 2011) (Unit S$ Million)



Foundation Grants:

FY07/08	S$15.5M (14 programmes)
FY08/09	S$17.9M (32 programmes)
FY09/10	S$19.6M (35 programmes)
FY10/11	S$20.7M (26 programmes)

One example of public management training is the programme for senior officials in the area of transportation planning and management in Danang, Vietnam. Lessons from Singapore's experience in transportation planning will assist the Vietnamese officials to tailor their local urban transportation development plans.

Another example is the interest of Mathla'ul Anwar in Indonesia to set up a model Islamic school for its network of over 900 madrasahs (non-boarding Islamic schools) in western Java. TF partnered Madrasah Al-Irsyad Al-Islamiah in Singapore to train Mathla'ul Anwar educators in curriculum development and pedagogy, and share best practices to develop the new school, which Mathla'ul Anwar could then adapt for Indonesia's needs.

Since 2007, TF's Leadership Enrichment and Regional Networking Programme enabled

over 1,000 students from 47 cities in Asia to develop a better appreciation of Asian socio-political issues.

TF's values for implementing programmes are as follows;
Meritocracy: to support programmes based on merit and outcomes, and to recognize and reward our team members based on merit and performance.
Excellence: passionate about delivering results through relevant and effective programmes, always aiming for excellence in our work.
Respect for People: to accord respect to individuals, communities and our fellow team members, and treat all as valued partners.
Integrity: to apply the highest ethical and professional standards in our conduct, communication and decision-making.
Innovation: to constantly look for ways to improve and innovate, and foster an environment that helps us learn from our successes and failures.
Teamwork: to value the diverse strengths of our partners and fellow team members, and harness these to achieve our shared purpose and vision.

Expertise partners, primarily from Singapore, include educational institutions, nursing schools and academies and public policy and public administration agencies. They contribute their knowledge and experience in designing programmes that are outcomes-focused, with an emphasis on "multiplying", or continuously sharing the new knowledge and skills gained.

The local host communities are engaged in formulating the programmes with their intimate knowledge of their immediate and long-term priorities, the state of development and what progress they would like to see in their communities. The close consultation with the host community partners, who are the key agents of change, also ensures that the programmes are customised to their needs, creating a meaningful and relevant learning journey. It also encourages a strong sense of co-ownership among all partners in working towards a shared goal of building a shared future in Asia.

3. Donors
Temasek Trust: S$500 million in 2007[1]

Apart from the initial endowment gift of S$500 million from Temasek Holdings, Temasek Trust has continued to receive additional gifts for each year of positive

wealth Temasek Holdings achieves in future. Such donations have added to the endowment in Temasek Trust, or been designated for specific uses. The Trust may also receive gifts from third parties for general endowment or specific purposes, but has not been actively soliciting donations from third party sources.

4. Recipients

14 Countries for country-specific programmes, such as Bhutan, Cambodia, China, Indonesia, Malaysia, Thailand and Vietnam and more nations for capacity-building programmes.

III. EU Framework Programme 7 (FP7) (International Organization)

1. Background Outline and Purpose of Establishment

The 7th Framework Programme for Research and Technological Development will last for seven years from 2007until 2013. The programme has a total budget of € 53.2 billion.

FP7 is a key tool to respond to Europe's needs in terms of jobs and competitiveness, and to maintain leadership in the global knowledge economy.

Most part of this money will be spent on grants to research actors all over Europe and beyond, in order to co-finance research, technological development and demonstration projects. Grants are determined on the basis of calls for proposals and a peer review process, which are highly competitive.

In order to complement national research programmes, activities funded from FP7 must have a “European added value”. One key aspect of the European added value is the transnationality of many actions: research projects are carried out by consortia which include participants from different European (and other) countries; fellowships in FP7 require mobility over national borders. Many research challenges are so complex that they can only be addressed at European level.

The Framework Programmes for Research have two main strategic objectives:

· to strengthen the scientific and technological base of European industry;

· to encourage its international competitiveness, while promoting research that supports EU policies.

The EU policies of developing research for the global knowledge-based economy focus increasingly on collaborative research, both within the EU and with external research

partners. Coordinating national or European teams, setting up research networks, and increasing the mobility of individual researchers are at the heart of such policies. Bringing together research teams from different countries is also a way of countering the fragmented nature of the European research landscape.

2. Funding Programmes

(1)Cooperation -Top down Research and Technological Development (RTD) -
Collaborative projects in the following 10 areas and interdisciplinary research.

1. Health
2. Food, agriculture and biotechnology (KBBE)
3. Information and communication technologies (ICT)
4. Nanosciences, nanotechnologies, materials and new production technologies (NMP)
5. Energy
6. Environment (including climate change)
7. Transport (including aeronautics)
8. Socio-economic sciences and the humanities (SSH)
9. Security
10. Space

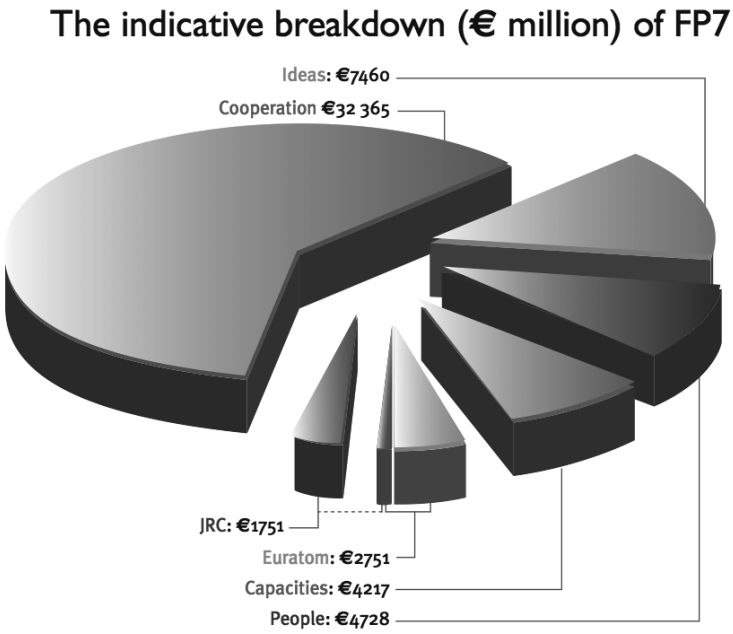
(2)Ideas -Bottom up Frontier RTD-
Supports frontier research and proof of concept, coordinated by the European Research Council (ERC).

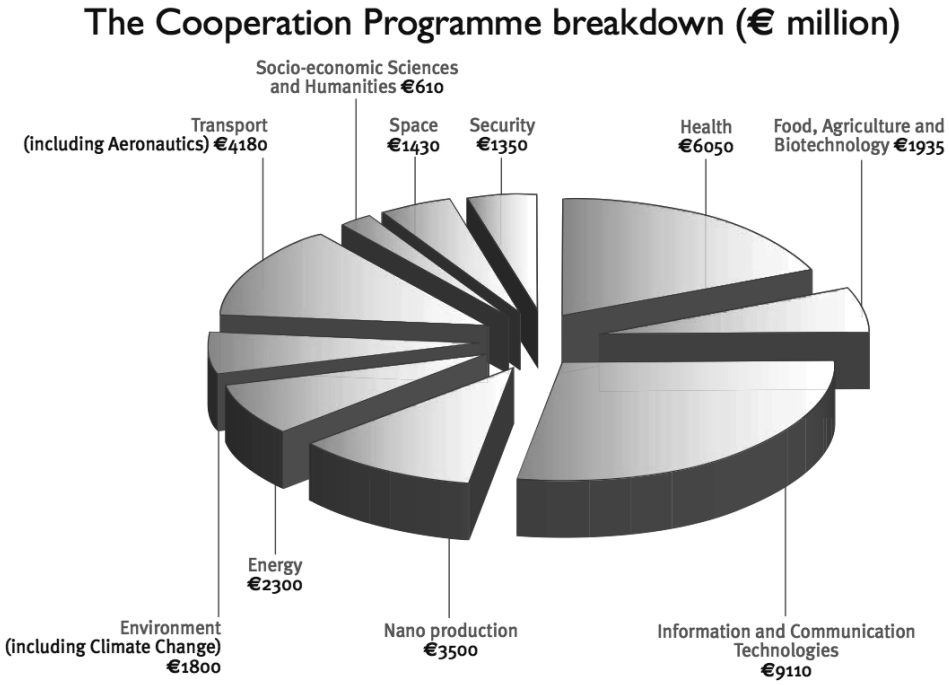
(3)People -Bottom up Mobility-
Marie Curie Actions: development of human resources and career, life-long training EURAXESS: job search, information service, assistance, networking.

(4)Capacities -Top down Capacity Building-
Increase of research capacity for the realization of knowledge based economy.

1. Research infrastructures
2. Research for the benefit of SMEs
3. Regions of Knowledge
4. Research Potential
5. Science in Society
6. Activities of International Cooperation
7. Coherent development of policies

(5)Euratom -Nuclear-
Independent programme for peaceful application of nuculear energy: Fusion energy research, nuclear fission and radiation protection





(FP7 Tomorrow's answers start today)

3. Donors

27 EU member states, 14 associated countries and areas, Norway, Iceland, Liechtenstein, Turkey, Croatia, Former Yugoslav Republic of Macedonia, Serbia, Albania, Montenegro, Bosnia & Herzegovina, Switzerland, Israel, Faroe Islands, Republic of Moldova

4. Recipients

Research groups at universities or research institutes, companies, SMEs, public or governmental administration (local, regional or national), early-stage researchers (postgraduate students), experienced researchers, institutions running research infrastructures of transnational interest, organizations and researchers from third countries, international organizations and civil society organizations etc. from any country in the world.

The procedures for participation and funding possibilities vary for different groups of countries.

The EU Member States enjoy the broadest rights and access to funding. The same conditions apply to Member States and to countries associated to FP7 (countries paying a share to the overall budget of FP7).

Another important group are the International Cooperation Partner Countries (e.g. Russia and other Eastern European and Central Asian states, developing countries, Mediterranean partner countries, Western Balkans countries). Participants from these countries are entitled to funding under the same conditions as EU Member States.

The only restriction for them is that consortia must first have the required minimum number of participants from Member States or associated countries.

Participation from industrialized high-income countries is also possible on a self-financing basis, with EU funding granted only in exceptional cases (Limited direct participation, eg. International Incoming Fellowship (IIF)).

IV. Human Frontier Science Program (HFSP) (International Organization)

1. Background Outline and Purpose of Establishment

The Human Frontier Science Program (HFSP) is unique, supporting international collaboration to undertake innovative, risky, basic research at the frontier of the life sciences. Special emphasis is given to the support and training of independent young investigators, beginning at the postdoctoral level. The Program is implemented by the Human Frontier Science Program Organization (HFSPO)[1], an international organization with its office in Strasbourg, supported financially by Australia, Canada, France, Germany, India, Italy, Japan, the Republic of Korea, New Zealand, Norway, Switzerland, the United Kingdom, the United States of America, and the European Union.

Since 1990, over 6,000 awards have been made to researchers from more than 70 countries. Of these, 18 HFSP awardees have gone on to receive the Nobel Prize.

2. Funding Programmes

(1)Long-Term Fellowships

– for young scientists within three years of obtaining their Ph.D who wish to broaden their scientific experience in a foreign laboratory.

(2)Cross-Disciplinary Fellowships

– modeled on the Long-Term Fellowships but specifically for scientists with Ph.Ds in non-biological disciplines who seek training in the life sciences.

(3)Career Development Awards

– for former HFSP Fellows to help them set up their own independent laboratories in the home country or another HFSP member country.

(4)Young Investigator Grants

– grants for interdisciplinary teams of young researchers who are within the first five years of their first independent positions and located in different countries.

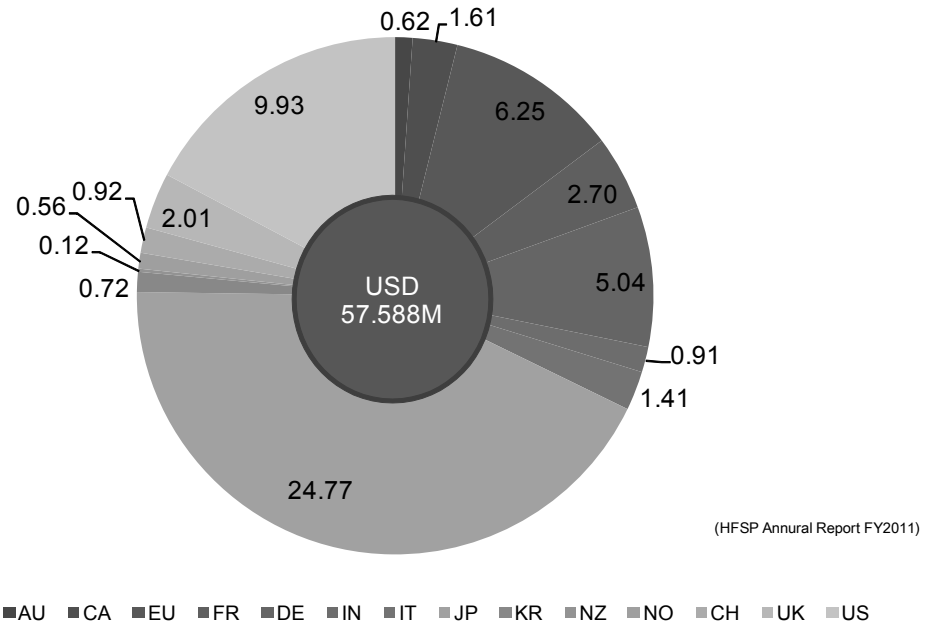
(5) Program Grants

– for interdisciplinary teams of researchers in different countries at any stage of their careers.

3. Donors

Australia, Canada, France, Germany, India, Italy, Japan, the Republic of Korea, New Zealand, Norway, Switzerland, the United Kingdom, the United States of America and the European Union

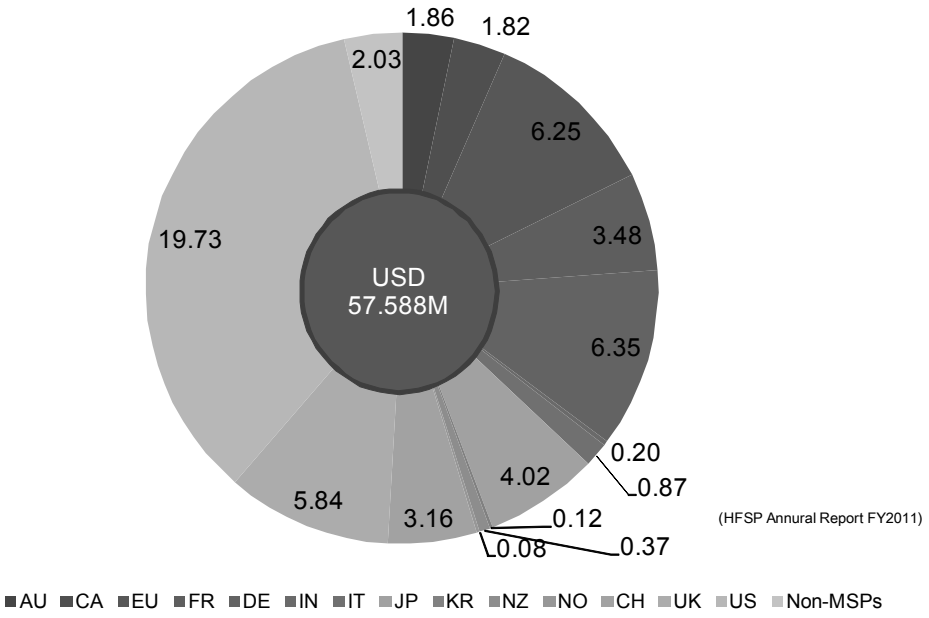
HESPO FY2011 Income (Unit: USD Million)



4. Recipients

Since 1990, over 6,000 awards have been made to researchers from more than 70 countries.

Distribution of Award Payments HESP Major Programme FY2011 (Unit: USD Million)



V. Drugs for Neglected Diseases initiatives (DNDi) (NPO)

1. Background Outline and Purpose of Establishment

(1)Outline:

In 1999, recognising the paucity of effective drugs in the world's poorer regions where they worked, Médecins Sans Frontières (MSF) brought together a team of international experts to study the crisis in drug research and development (R&D) for neglected diseases. This "Drugs for Neglected Diseases working group" analysed the causes of the crisis, and in developing innovative strategies to ensure the development of new and affordable medicines for neglected diseases, recommended the creation of a new initiative, DNDi. In 2003, 7 organisations from around the world joined forces to establish DNDi: 5 public sector institutions[1], one humanitarian organisation, Médecins sans Frontières (MSF) and one international research organisation, the UNDP/World Bank/WHO's Special Programme for Research and Training in Tropical Diseases (TDR), which acts as a permanent observer to the initiative. They are Founding Partners. The Drugs for Neglected Diseases Working Group approached and secured the participation of Founding Partners on the basis of their historical involvement in tropical diseases, and their interest and expertise in different aspects of R&D for neglected diseases, including advocacy, discovery and drug development. The social mission of the various organizations and their proximity to the needs of patients were also vital considerations. DNDi is a collaborative, patients' needs-driven, non-profit drug research and development (R&D) organization that is developing new treatments for Neglected Diseases.

(2)Vision:

To improve the quality of life and the health of people suffering from neglected diseases by using an alternative model to develop drugs for these diseases and by ensuring equitable access to new and field-relevant health tools.

In this not-for-profit model, driven by the public sector, a variety of players collaborate to raise awareness of the need to research and develop drugs for those neglected diseases that fall outside the scope of market-driven R&D. They also build public responsibility and leadership in addressing the needs of these patients.

(3)Objective:

The primary objective of DNDi is to deliver a total of 11 to 13 new treatments by 2018 for leishmaniasis, sleeping sickness, Chagas disease, malaria, paediatric HIV, and specific

helminth infections and to establish a strong R&D portfolio that addresses patient needs. Expanding upon R&D networks built on South-South and North-South collaborations, DNDi aims to bring medical innovation to neglected patients by developing field-adapted treatments.

DNDi has two further objectives:

- Use and strengthen existing capacities in disease-endemic countries via project implementation
- Raise awareness about the need to develop new drugs for neglected diseases and advocate for increased public responsibility.

2. Funding Programmes

(1)Concept:

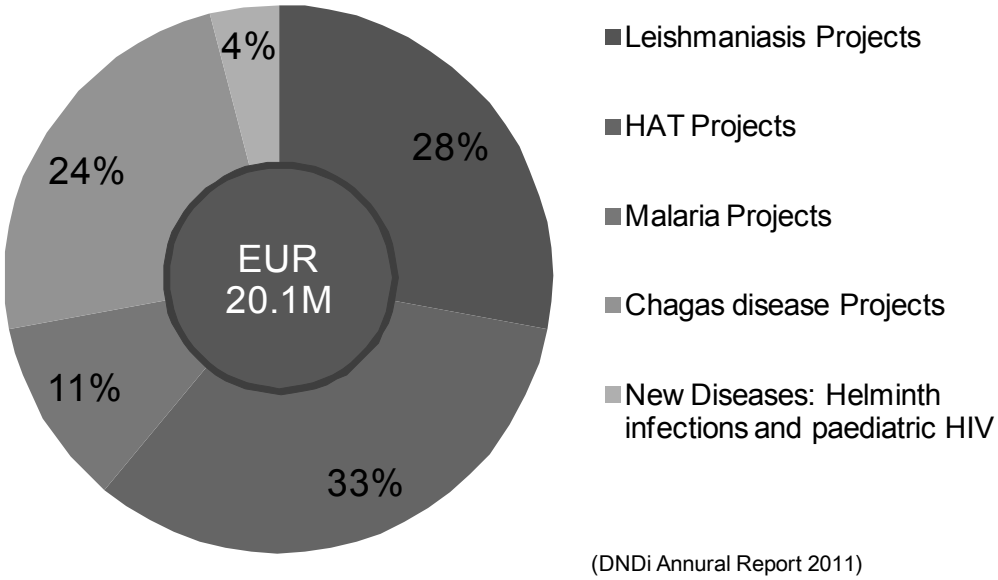
To develop new drugs, or new formulations of existing drugs, for patients suffering from the most neglected communicable diseases. Acting in the public interest, DNDi will bridge existing R&D gaps in essential drugs for these diseases by initiating and coordinating drug R&D projects in collaboration with the international research community, the public sector, the pharmaceutical industry, and other relevant partners.

DNDi's primary focus has been the development of drugs for the most neglected diseases, such as human African trypanosomiasis (HAT, or sleeping sickness), visceral leishmaniasis (kala-azar), and Chagas disease, while considering engagement in R&D projects for other neglected diseases or development of diagnostics and/or vaccines to address unmet needs that others are unable or unwilling to address.

In pursuing these goals, DNDi will manage R&D networks built on South-South and North-South collaborations. While using the existing support capacities in countries where the diseases are endemic, DNDi will help to build additional capacity in a sustainable manner through technology transfer in the field of drug R&D for neglected diseases.

DNDi has been building a strong R&D portfolio with the objective to deliver a total of 11 to 13 new treatments by 2018 for leishmaniasis, sleeping sickness, Chagas disease, malaria, paediatric HIV, and specific helminth infections Malaria.

2011 R&D Expenditure by disease



(DNDi Annural Report 2011)

(2)Virtual R&D Organisation:

DNDi does not have any research facilities and does not directly conduct research to develop its treatments.

DNDi will follow the virtual research mode, whereby most research is outsourced with the R&D projects actively managed by DNDi personnel experienced in different aspects of pharmaceutical development.

DNDi will proactively identify research opportunities that have the highest potential to be translated into improved treatment options, source the research project into its portfolio, build the full development plan, identify and contract the appropriate partners for each step in the development process, and manage the efficient advancement of the project throughout the pipeline.

(3)IP Policy:

DND*i* has various types of agreements with its partners worldwide, such as Research Services Agreements, Material Transfer Agreements, Research and License Agreements, Collaboration Agreements, Clinical Trial Agreements, and Financial Agreements.

Technical Agreements regulate financial transactions for precise services within a contractual framework. Material Transfer Agreements provide access to compounds for

testing in which no access clause with the provider is negotiated. In addition to these Agreements, DND*i* seeks to conclude Research and License Agreements with key partners which involve a greater commitment from both parties. The core of these agreements concern IP ownership (generally owned by the partner and in some cases co-owned), and licensing clauses. Several conditions are required to ensure availability and affordability of the treatment and respect of DND*i*'s IP policy objectives. As a not-for-profit and patient-needs driven organization, DND*i* seeks transparency to efficiently address urgent patient needs. Therefore, the licenses should be:

- **royalty-free** to ensure the lowest possible price
- **sub-licensable**, or in other terms, contain the authorization to disclose the obtained information to another party in order to continue product development
- **worldwide** coverage both for R&D and for manufacture
- **non-exclusive** to enable third parties to enter the field (included in our most innovative agreements)
- **limited confidentiality** to make available all information generated on the product during its development in the form of publications or databases.

R&D Partners and Subcontractors per Region

102 partners and subcontractors participated in advancing the DNDi portfolio in 2011.
44 among them are operating in Europe, 24 in America, 22 in Asia and 12 in Africa.

3. Donors

Public Institution, Private institution, Private Foundations and Private Individual as Donors

To allow the organization flexibility and sustainability, while preserving its independence, DNDi seeks to ensure balanced and diversified financial support from public and private donors; Private: Public = 51:49 as of January 2012.

Cumulative donations committed to DNDi and/or received by 2011 (in EUR)

Donors	Total Commitment (Amount)	Total Commitment (Ratio)
Médecins Sans Frontières	44,854,973	24.41%
Bill & Melinda Gates Foundation	43,720,379	23.80%
UK Government DFID	33,890,896	18.45%
Dutch Government DGIS	16,975,000	9.24%
Spanish Government AECID	12,000,000	6.53%
French Government MAEE /AFD	9,255,000	5.04%
German Government	9,000,000	4.90%
Swiss Government SDC	3,202,691	1.74%
Wellcome Trust UK	1,999,801	1.09%
USA Government NIH/NIAID	1,833,189	1.00%
Medicor Foundation	1,719,424	0.94%
European Union, FP5, FP6, FP7,EDCTP	1,216,134	0.66%
Canton of Geneva	1,117,401	0.61%
UBS Optimus Foundation	791,045	0.43%
Global Fund (AMFM)	518,205	0.28%
Various private donors	436,417	0.24%
Sandoz Family Foundation	308,700	0.17%
Sasakawa Peace Foundation	241,336	0.13%
Tuscany Region	200,000	0.11%
Wellspring Advisors	170,060	0.09%
Starr International Foundation	141,388	0.08%
Anonymous donation	138,108	0.08%
Total Donations (EUR)	183,730,147	100.00%

(DNDi Annual Report 2011)

4. Recipients (Partners and subcontractors)

Partners and subcontractors are, Pharmaceuticals (Astra Zeneca, Eisai, Merck & Co, Pfizer Limited etc.), Biotechs, Universities (Addis Ababa University (Ethiopia), Brasilia University (Brazil) Imperial College (UK) etc.), University "Spin-off", Research institutes, National Research Centres, NGOs/IOs, PDPs/PPPs, Hospitals, Ministries of Health/Governmental organizations, Contract Research Organizations (CROs).

(Reference)

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    http://www.hfsp.org/
12. HFSP Annual Report FY2011
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    http://www.dndi.org/
14. Charter of the Drugs for Neglected Diseases initiatives (DNDi)
15. DNDi Annual Report 2011

APPENDIX 3

Executive Summary
A Preliminary Study on the Development of International Open Innovation Research Centers in Asia

Yoshio Matsumi

Innovation is a key driver of economic growth, strengthening of international competitiveness, and improvement of quality of life. When the world economy is in stalemate or malaise, each nation is accelerating its efforts for innovation, making it an important part of growth strategy. Global innovation competition is intensifying. As eloquently stated in the recent American book entitled " Reverse Innovation: Create far from home, win everywhere ", the global dynamics of innovation are changing. No longer will innovation traverse the globe in only one direction, from developed nations to developing ones. It will also flow in reverse. Innovating for emerging markets to meet and satisfy needs in emerging countries, rather than simply exporting, can unlock a world of opportunities for corporations.

Science and technology are a driving force of innovation that means the creation of new social and economic values. Today traditional closed inward-looking research and development are no longer sufficient anymore when globalization is developing, when global challenges are becoming more complex, and when scientific and technological disciplines are melding. Under such circumstances, international university-industry-government collaborations in R & D are becoming increasingly more important. For more than a decade, large scale international open innovation research collaborations on a university-industry-government basis have been under way at SUNY Albany in the United States, MINATEC in France and IMEC in Belgium. In such research collaborations researchers of universities and corporations from a number of countries have been co-located in the same campuses. Advanced facilities and laboratory equipment have been shared and used openly. International collaborations have been developing not only in scientific research but also in talent development, capacity building and networking expansion. It is time for both developed and emerging countries to execute international and multilateral open innovation research collaborations on a university-industry-government basis, inviting different value judgments and wisdom as well as diversity.

Large scale international open innovation research centers (IOIRC) similar to the ones in the U.S. and Europe do not exist in Asia. If the efforts made at this International Policy Dialogue on Collaboration in Science and Technology in Asia result in launching international open innovation research centers in Asia with objectives to respond to and solve global challenges and local needs, there will be high expectations that such centers will realize innovation and contribute to development of Asia by combining diverse knowledge, wisdom and capability of Asian people. In the Workshop I Session 3, it is desirable to discuss direction and measures for establishing international open innovation research centers in Asia. I myself and the other Japanese speakers who will address three specific ideas on Asia IOIRCs will welcome and appreciate comments or suggestions from participants from various countries of Asia. It is advisable to continue dialogues and discussions about realistic measures for implementation of Asia IOIRC scheme even after this workshop

The first idea is an increasing multilateral collaboration between the National Institute of Materials Science of Japan (NIMS) and Asian countries. To date NIMS has already been actively developing cooperation with Thailand and China. It has also been working together with South Korea, Singapore, Thailand, Taiwan, Malaysia and Vietnam through Asia Nano Forum. But NIMS apparently has a strong interest in launching collaborations with business firms of Asia and expanding collaborations on a multilateral basis. NIMS is also eager for two way exchanges with Asian researchers. NIMS currently operates five international open innovation centers including International Center for Materials Nano-architectonics and Center of Materials Research for Low Carbon Emission. A realistic approach to international open innovation collaborations using the existing facilities like the ones of NIMS should be beneficial to every party.

The second idea is an international collaboration between Tsukuba Innovation Arena of Japan (TIA) and Asian countries. About 100 companies participate in TIA's 17 research projects in nano-electronics, power electronics, N-MEMS, nano-green, and carbon nanotubes. About 300 corporate researchers are co-located at TIA. Participation by industry is a very important aspect of TIA. TIA is interested in welcoming more Asian researchers to Tsukuba, Japan and having them use the modern facilities and equipment at TIA to conduct research on nanotechnology for green innovation. TIA has an interest in more international joint R & D that can provide the best utilization of the TIA facilities. If TIA and Asian countries can develop open innovation nanotechnology research on a multilateral and university-industry-government basis in energy and

environment, every party can be expected to benefit significantly.

The third idea we will discuss today is the establishment of an international open innovation research center on renewable energy and next generation biomass energy in particular in Thailand. In coping with global warming and developing green economy, renewable energy is expected to play a major role in reducing greenhouse effect gas emission, replacing fossil fuel energy in the future. About 40% of world's biomass reserves are available in Asia. Several countries in Asia including Thailand have expressed a strong interest in the strategic development of biomass and its application to fuels from the perspectives of energy security and conservation of environment. It appears highly advisable to pursue the launching of an international open innovation renewable energy research center in Thailand on next generation technology for bio-diesel fuels from biomass, opto-synthesis, energy from algae and bio-refinery. Technology-rich countries and resource-rich economies of Asia could work together on vitally important renewable energy in Thailand, which is located in the center of South East Asia. The renewable energy research collaboration in Thailand could get started at an existing facility in Thailand with the participations of other Asian countries and eventually launch a new IOIRC in future.

It should be noted that there are two critical factors for the success of international open innovation research centers. One is funding. The other is participation by industry. As for funding of international open innovation research centers, concerted efforts in Asia must be made to raise and secure funds from governments, public funding organizations, private sector foundations and business firms. Various schemes such as Asia JRP, SATREPS, A-STEPS, AUN-SEEDNet should also be mobilized. Secondly industry participation in international open innovation research collaborations is of mounting importance. Without the active role of industry, university-industry-government collaborations will not be able to deliver innovation to society. All the parties concerned are urged to have industry participate in open innovation research collaborations in Asia from an early stage.

One day discussions about the launch of international open innovation research centers will not likely be concluded in very specific manners. Therefore, discussions must continue through the next year so that all parties can jointly reach a final specific decision.