development asia

A publication of the Asian Development Bank

April–June 2011

Also in this edition...

- *Aid Debate: Taking a long, hard look at the impact of development projects*
- *Filipino physicists make quantum improvements in basic education*
- *Nanotechnology: Deploying micro machines to solve the world's problems*

MAKING THE GRADE?

Analyzing the state of education across Asia, from grade school to trade school

Critical Thinking...

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"ADB is not trying to inspire the kind of optimism that is typical of PR publications, but hopes to trigger serious debate."

Hugh Williamson
Europe News Editor
The Financial Times

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Cover photo: Students of Sainshand School No. 2 in Mongolia
Picture credit: Kevin Hamdorf

Note: In this publication, "$" refers to US dollars

ADB haymarket

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Teaching Prosperity

Education attacks poverty at its roots, laying the groundwork for achieving all development goals. Teaching children to read and write, for example, not only improves their employment prospects, but also better attunes them to their country's development goals—all of which depend on disseminating important information to be successful. As such, literacy is the foundational cornerstone for development.

The setting of the Millennium Development Goals (MDGs) in 2000 provided fresh impetus to promoting equal access to education, particularly in Asia and the Pacific. The 2010 status report on the MDGs by the Economic and Social Commission for Asia and the Pacific, Asian Development Bank, and the United Nations Development Programme shows that despite the economic crisis, the region is still on target to meet these goals. The region has reduced gender disparity in primary, secondary, and tertiary education enrollment.

Increasing enrollment rates, however, is not enough. The dropout rate in the region continues to be high, and the need to improve the quality of education as well as to provide better incentive and support mechanisms for poor families to keep the children in school remain as strong as ever.

In this edition of *Development Asia*, we take stock of the region's successes and remaining challenges in the education sector. We look at different approaches to reform the educational system to advance national interests, from building elite universities to strengthening vocational programs. Our story on the Republic of Korea relates efforts of the state to wean students' overdependence on private tutoring, which is jacking up the cost of education. In "Preparing for a Windfall," we talk about how Mongolia is consolidating its economic gains by investing in schools—even in the Gobi Desert.

In other stories, we feature physicists Christopher and Maria Victoria Bernido, recipients of the 2010 Ramon Magsaysay Award who are credited with bringing innovative science teaching techniques to one of the poorest communities in the Philippines. We also look at how advances in nanotechnology could benefit or impede development work.

As with all editions, we hope to present stories that go beyond the textbook explanations and enliven the dialogue on educational issues. Education, in particular, is at the very core of the region's hopes for development and increased prosperity.

Please send us comments at **editor@development.asia.**

Class dismissed! ■

Ann Quon
Publisher

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ARTICLES

DEPARTMENTS

Letters to the Editor

e-Subscribers Sound Off

I was forwarded a copy of the most recent issue and have thoroughly enjoyed it, both in readability and content.

Anthony D'Agostino, Research Associate
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Singapore

Very good. Focused and concise in delivery.

M. Boominathan, Principal Economist
Wilbur Smith Associates Inc.
Chennai, Tamil Nadu
India

The publication is very good [at reporting on] the development in Asia.

Made Antara, Lecturer
University of Udayana
Denpasar, Bali, Indonesia

Found it on the ADB website. Enjoy learning about changing topics related to Asian development.

Charlotte Hollmatz
Baden, Germany

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Bruce Heilbuth has worked as a journalist and foreign correspondent on four continents. He spent nearly a decade as the editor-in-chief of *Reader's Digest* magazine's Australasian and Asian–English editions.

James Hutchison has worked as a writer and photographer in Asia for more than 25 years. His work has appeared in more than 30 international publications.

John Otis is the Colombia correspondent for *Time* magazine, *GlobalPost*, and the BBC/Public Radio International program *The World*. He wrote *Law of the Jungle*, the story of three US military contractors kidnapped by Colombian rebels and rescued in an elaborate sting operation, published in February 2010 by HarperCollins Publishers.

Margo Pfeiff is a Canada-based journalist who worked as a special correspondent for *Reader's Digest* for 17 years. She is currently researching a book on the Arctic.

Floyd Whaley, senior editor of *Development Asia*, operates Asia Editorial Services. His work has appeared in the *International Herald Tribune, USA Today, Los Angeles Times, Discovery Channel Magazine*, and many other media outlets.

Bread for Babies

"Public money should be concentrated not on supplying cheap food but on providing for those who do not control what they eat: babies and children. The most important period in anyone's nutritional life is the first 1,000 days. Improving infant diets does a lifetime of good. But this depends on education and policy 'nudges,' not cheap rice."
—*The Economist*, 24 March 2011

A Foreign Investment

"When President Obama toasted Hu [Jintao], he wisely quoted a Chinese proverb that says if you want to build for a hundred years, invest in people. This is what the United States essentially has been doing since the opening to [the People's Republic of China] in 1971."
—*The Washington Post*, 21 January 2011

Bailout Syndrome

"The strains in Tokyo and Lisbon reflect a broader problem: As advanced-nation governments take on increasing responsibility for insulating their citizens, investors, banks and companies from the pain of disasters, they are pushing their financial resources closer to the limit. That, some economists say, could leave them without enough wherewithal to respond the next time a big crisis happens."
—*The Wall Street Journal*, 28 March 2011

Divine Intervention

"At Diwali last year, a desktop computer and a laptop were the recipients of a *puja* (blessing ceremony) in the business district of New Delhi. Housewife Gauri Sharma told reporters: 'Generally we see shopkeepers praying to their account books on Diwali, but this is the first time I am seeing *puja* [blessings] being done to computers.'"
—*The Jakarta Post, 23 January 2011*

Calling Big Brother

"The Uttar Pradesh government's scheme, Supercaller, to monitor mid-day meals served to school children through mobile phones is a novel idea and worth replicating by other states. . . . Mobile phones and their ubiquitously embedded cameras can be used to monitor all development programmes. It will ensure better outcomes and help curb corruption, rampant in many of these schemes."
—*The Economic Times, India, 22 January 2011*

The Global Factory

"Today the concept of country of origin is obsolete. What we call 'made in China' is indeed assembled in [the People's Republic of China], but its commercial value comes from those numerous countries that precede its assembly. It no longer makes sense to think of trade in terms of 'them' and 'us'. . . . Economists have long abandoned the view that trade is a zero-sum game, but the day-to-day worlds of politics and markets still seem to work on old mercantilist beliefs."
— *Pascal Lamy, director-general of the World Trade Organization, in an opinion piece for the The Financial Times, 24 January 2011*

Pressure Cookers

"Perhaps as much as a lack of democracy and human rights, the lack of food security played a major role in the downfall of [former Tunisian President] Ben Ali, and it is something that can spell trouble for governments everywhere if effective strategies aren't put in place to avoid food shortages."
—*The Bangkok Post, 23 January 2011*

Compiled by Maria Liza Solano

Giving Wisely

GiveWell

http://givewell.org/

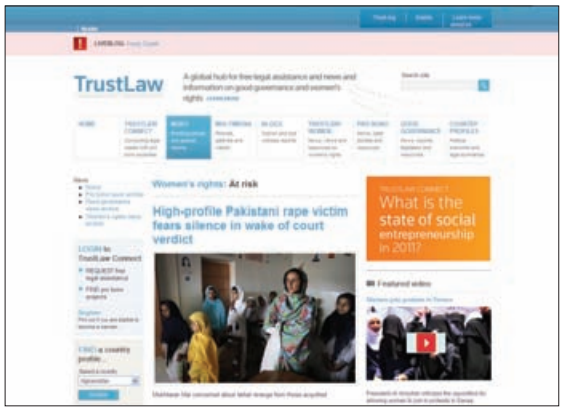
Charitable giving is complex. It is often spur of the moment, in reaction to a heart-wrenching news report. It is sometimes a tax shelter. Other times, giving to charity is a religious or cultural mandate. But unlike an investment in a stock or a piece of property, charitable donations usually involve little research or scrutiny. Stringent due diligence is rarely associated with giving from the heart.

That is where the organization GiveWell steps in. It bills itself as an "independent charity evaluator" that focuses on financials, assessing administrative or fundraising costs.

"We focus on how well programs actually work (and) their effects on the people they serve," notes the organization's website. "We find outstanding charities and publish the full details of our analysis to help donors decide where to give."

The site ranks charities in the United States and worldwide according to the following categories: evidence of effectiveness; cost-effectiveness; funding; transparency; and monitoring and evaluation. It includes a ranking of the top charities, according to its criteria (VillageReach, which distributes medical supplies in Africa, tops their list) but it also allows users to search for charities by name or area of work.

The site also has a button that allows users to donate via Google Checkout. This allows a user who has, for example, a $500 donation budget to search through the site and give portions to different charities based on their rankings and areas of focus. ■



Get a Lawyer

TrustLaw Connect

http://www.trust.org/trustlaw/connect/

Many nonprofit and nongovernment organizations operate on a shoestring budget. Keeping a law firm on retainer, or hiring an attorney to address a specific issue or problem is often beyond their means.

The Thomson Reuters Foundation, a charitable wing of the international news and information service, has devised a clever web-based solution to this dilemma with their TrustLaw Connect site.

The website is described as "a free international pro bono vehicle designed to make it easier for organisations with limited means to access free legal assistance and simpler for lawyers to engage in high-impact pro bono work."

Organizations register with the site and then fill out an online request form outlining their legal problem or need. The website moderators clarify any missing information then send out the request as an alert to the member law firms. Law firms evaluate the requests and within a prescribed time frame accept on a pro bono basis those that fit their interests and expertise.

Some of the legal issues they can handle include intellectual property matters; employment law and human resources issues, including employment contracts with staff or volunteers; structuring and drafting of funding or loan agreements; advice on partnership agreements or customer contracts; advice on construction, property, real estate, lease and tenancy, or utility contracts; and legal research on human rights, environment, equal rights, or land rights issues. ■

Researched and written by Floyd Whaley

Learning by Numbers

Asia is the world's poster child for increasing school enrollment, but the region faces high hurdles in taking the next step toward creating a world-class educational system

BY Margo Pfeiff

Asia is a global success story when it comes to educating children. Numbers may vary from country to country, but overall 9 out of 10 children in the region today are enrolled in primary school. For a continent that contained two-thirds of world's out-of-school children in the 1970s, the progress has been nothing short of remarkable, experts say.

The polish wears off the apple, however, once countries must go beyond the basics and try to accommodate students' needs for skills that translate into good jobs. While much progress has been made over the past 10 years, indicators still point to serious education and human-resource shortfalls at all levels throughout the region, a reality that may dampen Asia's lofty economic aspirations.

In today's globalized work environment, where competition comes from abroad as well as the next work station, classrooms must cater to a job market that in many countries demands increasingly technical and information technology-based know-how, experts say. Populations with higher skill

WAITING GAME **Parents wait anxiously outside the high school where their children are taking the entrance exam. Students in the People's Republic of China aspire to enter top-quality high schools in preparation for a nationwide college entrance exam, regarded as one of the fiercest academic competitions in the world.**

PICTURE CREDIT: AFP

levels will be essential for Asian countries seeking to accelerate growth. "Education and training are going to be at the heart of sustaining the economic growth and resilience of the Asian economy," says Shanti Jagannathan, an education specialist with the Asian Development Bank (ADB). "A lot will depend on how the education and training systems are handled and how rapidly they can respond to changes."

Employment prospects draw multitudes to cities, where the educational offerings are often not prepared to transform them into the workforce of tomorrow. In the People's Republic of China (PRC), for example, the flow of unskilled workers from rural to urban areas is at least 10 million a year. Regions such as South Asia are seeing a huge bubble of people under 25 seeking education or facing a future of unemployment. Human capital is a vital part of economic development, but in many countries access to quality education—from primary through secondary and tertiary—is not keeping up with the pace of progress. Thus, an education shortfall translates directly into a shortage of skilled workers. A lack of skilled workers in turn cools businesses' expansion plans, potentially putting countries' growth prospects in peril.

MEETING DEMAND

In the push to get all children into primary school over the past 20 years, quantity has often trumped quality. Even when children complete one level of schooling, their minimum competency is too low to handle the next level in many cases. The result has been a growing number of basic education graduates who leave school without marketable skills—that is, skills that translate into jobs.

While Asia is comprised of increasingly dynamic economies with strong demands for skilled labor, the region also suffers from a gap between education outputs and labor market needs that is widening more rapidly than in other developing regions. "More resources and innovation are needed to improve the quality of education at all levels to meet the demands of the workforce because the labor markets are evolving," explains Jouko Sarvi, practice leader and chairman of the Education Sector Committee at ADB. "There is often a skills mismatch between labor market needs and what kind of graduates are coming out of the school system. This creates an economic and social bottleneck that restricts growth."

PICTURE CREDIT: AFP

CULTURAL CHALLENGES **Arabic language and Islamic values education is offered in selected public schools in the Philippines, where Muslims are the minority. Among the challenges facing educators in the region is the wide diversity of students.**

"The goal is to have an inclusive education and inclusive human development through each level of education instead of an elitist system. That is the challenge"

—Jouko Sarvi, chair of the Education Sector Community of Practice at Asian Development Bank

Establishing centers for tertiary education is often cited as a way of improving a country's competitiveness, and the demand for higher education is expected to double in 5 years and triple in many countries in less than a decade. Still more emphasis is needed on other avenues of learning: basic adult education, including literacy and numeracy; vocational training, including retraining workers in declining industries and upgrading the skills of those tackling new enterprises; and on-the-job training, providing for continued learning in the workplace, especially in high-tech fields because skills may quickly become obsolete.

"Countries need to look at the continuum of education and how they should implement holistic reforms that meet the challenges that a particular country is facing, whether it is economic or issues of social inclusion. The challenges facing Nepal are different from those in Viet Nam, for instance," Jagannathan says.

THE ABCS OF MDGS

Primary school is the first building block of any educational system: success at higher levels depends on the quality of that foundation. An international push for universal primary school enrollment was kick-started in 1990 at the World Conference on Education for All in Jomtien, Thailand. Representatives from 155 countries and 150 organizations agreed to "universalize primary education and

massively reduce illiteracy by the end of the decade." Education for All became a global movement led by the United Nations Educational, Scientific and Cultural Organization (UNESCO). Basic education was declared a fundamental human right.

A decade later in 2000, the international community met again in Dakar, Senegal, to assess progress. Findings were mixed, but it was clear to the 1,100 participants that many countries were far from reaching the heady goals set in 1990. An updated set of six measurable targets—including free and compulsory primary education, increasing adult literacy, and gender equality—were set with the aim of meeting the learning needs of all children, youth, and adults, particularly females, by 2015.

That same year all 189 United Nations member states at a summit in New York agreed on the Millennium Development Goals (MDGs): eight international development goals to be achieved by 2015. Goal 2 is to achieve universal primary education, and Goal 3 seeks to eliminate gender disparity in primary and secondary education. In 2002 the Fast Track Initiative was launched to accelerate the progress of struggling countries by providing funds, teachers, and tools to help achieve primary school MDGs in conjunction with donor countries and agencies, including ADB, UNESCO, and the World Bank.

As a result, assistance to developing countries in Asia for basic education nearly doubled to $4.4 billion from $2.6 billion between 2000 and 2004. The region went from having two-thirds of the world's out-of-school children in the 1970s to less than one-third today. By 2006, East and Southeast Asia scored the world's most dramatic success toward universal primary education. This was due in large part to the PRC's primary school enrollment skyrocketing from 20% to 97% by 1990.

Some of the biggest inroads were made in countries that started with the lowest levels: in over a 20-year period, Bhutan moved from only a tiny population of schoolchildren to almost half of all children receiving 5 years of education. The Maldives hit 90% attendance. South Asia not only reached 90% enrollment—up from 72% in 1991—but also had the region's greatest gains in gender parity with 95 girls enrolled per 100 boys, up from 77 girls per 100 boys in 1991. Despite the improvements, however, 18 million children in South Asia remain out of school, more than a quarter of the world's total.

GIRLS ON THE MOVE **Wearing gym clothes under her uniform, this young resident of Ulanbataar, Mongolia sprints off to class. There is a global campaign to get girls into primary and secondary school.**

In reality, impressive statistics aside, enrollment figures are much lower and not improving significantly in some countries and rural pockets: Afghanistan and Pakistan's net enrollments are below 60% while Bhutan's and Nepal's are less than 70%. And even 90% average attendance throughout Asia means 25 million children are still unable to access primary education. Often those left out belong to particularly vulnerable minorities—ethnic groups, immigrant communities, refugees, impoverished families, the disabled, street children, and girls.

Many countries viewed attaining universal basic education as simply getting youngsters behind desks, without planning how to keep them there. As a result, dropout rates are high. In more than half of developing Asian countries, only 7 out of 10 children complete primary school and only 4 finish secondary school. Poverty is the major driver for dropouts: in rural areas children frequently must work to help the family survive. Efforts have been made to keep them in school by adjusting school vacation times to coincide with harvest seasons and arranging flexible school hours for working children. Some families are offered conditional cash transfers, money handed directly to parents—usually the mother—with the condition their children regularly attend school.

Food is also an incentive to help children stay in school since parents see it as a way to help feed their school-age offspring. Food-for-education programs provide nutrition and calories to help children stay alert and make progress at school. Some programs also include take-home rations to help offset a child's time away from helping with the family. In 2005, 74 countries in conjunction with the World Food Programme and other agencies reached 22 million children worldwide, including the Lao People's Democratic Republic (Lao PDR) and Nepal, with food-for-education programs.

Another key issue facing the region is an erosion of salaries in past years and the low status of teachers, which has

PICTURE CREDIT: AFP, KEVIN HAMDORF

INDIA

In remote regions of India where no primary schools exist, alternative and innovative education (AIE) learning centers have been set up. There local teachers use primers in the regional tribal languages to help young children transition into regular schools. In far-flung locales, AIE's method provides maximum flexibility, making a classroom out of whatever structure is at hand.

For example, classes are held in huts to teach the children of brick kiln laborers. Other AIE teachers set up classrooms near temples where children of migratory workers beg. Mobile vehicles serve as schoolrooms to teach Delhi's street children while tents provide cover to reach kids in Kashmir. And in the fishing communities of Andhra Pradesh, kids are taught on boats with the hope of eventually streaming them into traditional schools. These diverse options may seem like spotty accommodations, but in all an estimated 2.8 million children attended AIE centers in 2006. ■

STREET SCIENCE **An instructor gives students a demonstration from his mobile laboratory at a science exhibition in Hyderabad, India.**

made the profession less attractive. In Bangladesh, the Kyrgyz Republic, the Lao PDR, and the Maldives, less than 80% of teachers are formally trained.

Against this challenging backdrop, many nations in the region are struggling to achieve gender parity, with strong pushes to get girls into primary school (64% of the world's adult illiterates are female). While girls do have higher retention rates than boys in primary school, they are less present in secondary education. In some parts of the region, as many as half the children who complete primary education fall back into functional illiteracy, cutting off avenues for further education and entry into the workforce. Flexible curricula and alternative pathways should be available so that secondary level dropouts can still learn skills to be productive in the economy.

While some countries such as Bangladesh, the Lao PDR, and Nepal still struggle with primary school basics, the Republic of Korea is at the other end of the spectrum. The country has invested heavily in education, vastly improving its economic competitiveness and social inclusion, and has risen to the top of international educational performance indicators. The same is true of Hong Kong, China; Singapore; and, increasingly, Malaysia.

SHADOW SYSTEM

Every year the Organisation for Economic Co-operation and Development (OECD) evaluates the quality, equity, and efficiency of school systems in 70 countries that make up 90% of the world economy. They administer the Programme for International Student Assessment (PISA), a test for 15-year-old students worldwide to provide an internationally standardized assessment tool for countries to upgrade their education systems. The Republic of Korea, Singapore, and Hong Kong, China have for years reigned at the top of PISA scores, which measure math, science, and reading skills.

The PRC, whose primary school retention rate is 96%, participated in PISA for the first time in 2010 with 5,100 students from the Shanghai area. To everyone's astonishment, the PRC scored first by a significant margin in all three categories, ahead of the Republic of Korea and Finland, the highest-performing countries traditionally.

Experts are quick to note that the PRC's impressive scores were likely due to the fact that only students in progressive, affluent Shanghai were tested. If a random sample of all PRC students were taken, the result would likely be much different. Still, the scores indicate that the PRC is trying to become a regional leader in education.

Many argue these rankings may not necessarily indicate a good basic education system, but rather may point to an extensive "shadow" system comprised of intensive evening and weekend tutoring, which is a big industry in parts of Asia, including Shanghai. In Western countries, such as PISA powerhouse Finland, there is almost no tutoring.

"Ideally countries should have their own national testing system which

PICTURE CREDIT: AFP

'WE'RE NUMBER ONE" **An elementary school student in the province of Anhui in the People's Republic of China raises her hand. Nine out of 10 children in the region are now enrolled in primary school.**

tracks student learning so it can be understood why they are not reaching competency levels, a system that tracks student performance over the course of the schooling cycle," Jagannathan says. Rather than just examinations, there needs to be a system of continuous and extensive evaluation so that children are tested for comprehension, not just rote learning, she says. A system of student assessment also gives feedback to educators to adjust the curriculum. "These are issues that are really challenging policy makers. How do you have national level systems that can do all of these?"

WIELDING ECONOMIC POWER

In order to take the next leap in education and focus on quality and inclusiveness, Asian countries will have to use their economic force to finance high-quality education. The region has spent mightily to construct schools and rapidly increase primary school enrollment. Still, expanding inclusiveness, offering better access to quality education especially for the poor and disadvantaged, and retaining more students in higher levels of education will be much more expensive, complex, and challenging. Comprehensive reforms are needed throughout the system to ensure education's relevance to the labor markets' needs—so that good students can get good jobs.

"It's been proven that simply throwing money at education issues doesn't work," says ADB's Sarvi. Despite large increases in education spending in many OECD countries, test scores have not significantly increased for decades. Some of the changes that have proven successful and cost-efficient in the past include improving teacher training, curriculum, and preschool programs. A recent study in the Philippines showed that preschooling has had the greatest impact there on school completion. Incentives for students, teachers, and schools to perform well are also key ingredients in raising the bar of quality in education.

Progress can be hard to track because accurately measuring performance requires reliable and uniform assessment tools, such as national exams, which don't exist in many countries. As a result, Education for All and other international monitoring groups have to make do with comparing physical indicators such as the number of qualified teachers, absenteeism and completion rates, average class size, and primary education expenditures as a percentage of gross national product.

Just as educational models need to be flexible to meet future demands in the workplace, the delivery method needs to adapt as information and communication technology becomes more accessible. Technology changes not only the way students learn, but also how teachers are trained and the quality of teaching, especially

PICTURE CREDIT: AFP

in remote areas. Only recently have educators universally accepted that computers can create a better learning environment. An ADB study found encouraging results related to the use of information and communication technology in classrooms. Students were more motivated and worked better in teams; absenteeism decreased; test scores rose; and computer literacy and communication skills improved.

Traditionally, governments have financed primary education. It is far and away the most economical level of education, a bargain costing 14 times less per student than secondary education and 34 times less than tertiary education on average in developing countries. The relative expense of higher education means that the more developing countries expand their higher education system, the more they run into problems with financing. In most Asian countries, higher education remains public, a condition that increases access while capping quality because of budgetary strictures; there are private higher education systems, but the rules and regulations governing private higher education are not well developed and heavily favor the wealthy. Alas, governments cannot expand higher education systems simply with public funds; they must find innovative financing options, including public–private partnerships, to make certain a country's best talent is not locked outside the university gates.

The Republic of Korea offers an example of what is possible when higher education is privately financed and administered with national priorities in mind. "Pro-poor" institutions—private higher education schools—provide slots to take in talented students who might otherwise not be able to afford that level of education. "The goal is to have an inclusive education and inclusive human development through each level of education instead of an elitist system," says Sarvi. "That is the challenge."

Increasingly, the private sector is playing a role in education with money and management, not only in tertiary education, but also more recently in secondary and primary education. Governments are acknowledging the merits of public–private partnerships, in which private sector resources and efficiencies complement the public sector's national educational priorities.

"Education is not all about the primary level anymore," says ADB's Jagannathan. "It doesn't pull children out of any poverty trap, give them a sustainable livelihood, or put them on track for a more informed role in society. What is needed is improving the quality of education, across the board." ■

STAY ON TRACK **A boy follows the railroad track on his way home from school in a Bangkok slum. Though enrollment in Asia has improved, the dropout rate continues to be high, mainly due to poverty.**

LATE FOR SCHOOL **Street children sit in front of a banner that says "Your child, My child: They both must go to school" in Phnom Penh, Cambodia.**

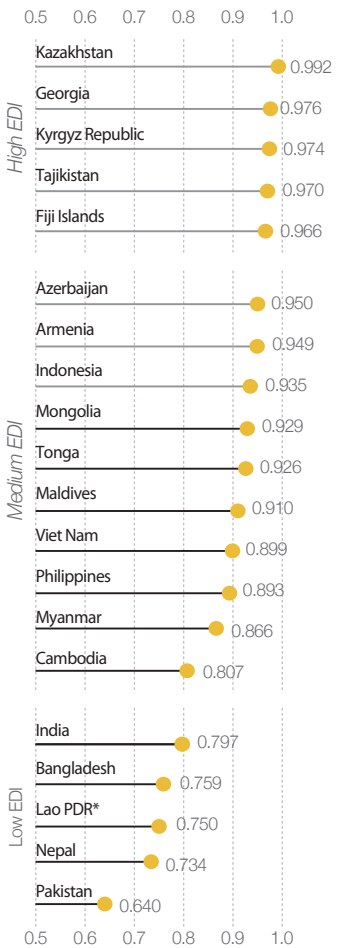
PICTURE CREDIT: AFP

Learning Curve

Asia is close to achieving the goal of universal primary education by 2015. Increasing enrollment rates, however, are only the first step toward addressing every child's right to quality education and building the human capital to support the region's continued growth.

A broader index

The Education For All Development Index (EDI) takes into account primary enrollment, adult literacy, gender equity, and survival rate to grade 5.

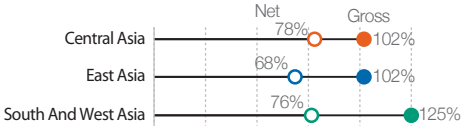


Indicators: Taking the Pulse of Education in Asia

Some of the many statistics analyzed to understand the state of education in Asia:

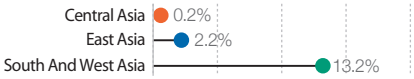
Intake Rate, Primary Grades

Number of students entering each grade, as a percentage of the overall population at the age for that grade. **Net intake rate** compares only those students of the age for that grade. **Gross intake rate** compares all students entering a grade, regardless of age, and thus includes repeaters and those entering school later than the normal age.



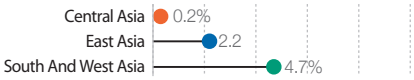
Dropout Rate, First Year of Primary

Percentage of students enrolled in the first year of primary education who do not finish the school year.



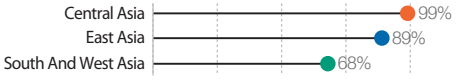
Grade Repeaters, All Primary Grades

Percentage of those enrolled in each grade who begin the next school year in that same grade.



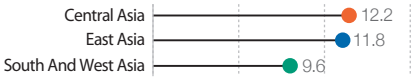
Survival Rate to Last Grade of Primary School

Percentage of students enrolled in the first year of primary education who reach the highest grade of primary education.



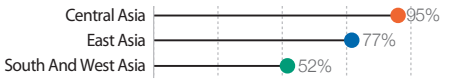
School Life Expectancy

Years of education a country's students receive, on average.



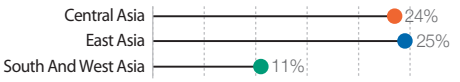
Secondary Education Enrollment

Number of students enrolled in secondary education, as a percentage of the total population of secondary-education age.



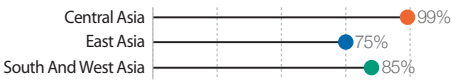
Tertiary Education Enrollment

Number enrolled in tertiary education, as a percentage of the total population of tertiary-education age.



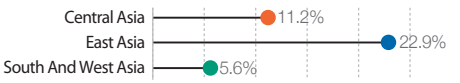
First-Level Tertiary Enrolment

Tertiary students at the first of three possible levels, as a percentage of tertiary students at all levels.



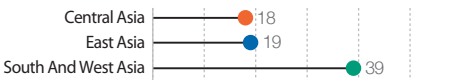
Technical Fields of Study

Engineering, manufacturing, construction, and science fields, as a percentage of all fields of study at the tertiary level.



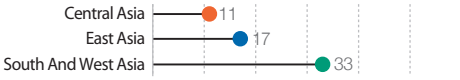
Pupil-to-Teacher Ratio at the Primary Level

Average number of students per teacher.



Pupil-to-Teacher Ratio at the Secondary Level

Average number of students per teacher.



*Lao PDR = Lao People's Democratic Republic

Subregions in Asia as defined by the United Nations Educational, Scientific and Cultural Organization (UNESCO)—Central Asia: Armenia; Azerbaijan; Georgia; Kazakhstan; Kyrgyzstan; Mongolia; Tajikistan; Turkmenistan; and Uzbekistan. East Asia: Brunei Darussalam; Cambodia; People's Republic of China; Democratic People's Republic of Korea; Indonesia; Japan; Lao People's Democratic Republic; Macao (China); Malaysia; Myanmar; Philippines; Republic of Korea; Singapore; Thailand; Timor-Leste; and Viet Nam. Pacific: Australia; Cook Islands; Fiji; Kiribati; Marshall Islands; Micronesia (Federated States of); Nauru; New Zealand; Niue; Palau; Papua New Guinea; Samoa; Solomon Islands; Tokelau; Tonga; Tuvalu; and Vanuatu. South and West Asia: Afghanistan; Bangladesh; Bhutan; India; Islamic Republic of Iran; Maldives; Nepal; Pakistan; and Sri Lanka.

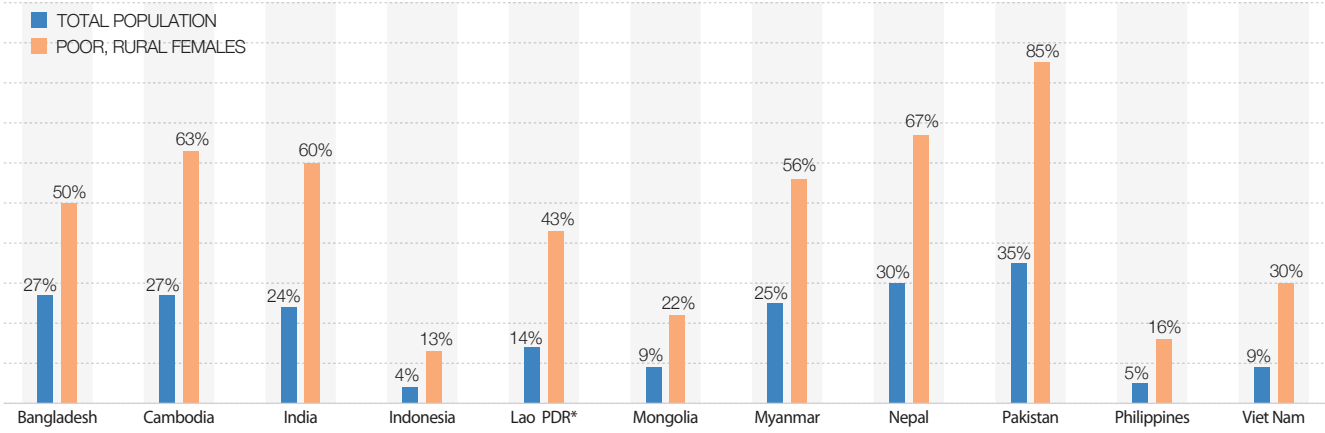
Sources: *Education by 2020: A Sector Operations Plan* (Asian Development Bank); *EFA Global Monitoring Report 2010: Reaching the Marginalized* (United Nations Educational, Scientific and Cultural Organization)

Marginalized: Missing Out on Progress

Asia has seen remarkable improvement in access to education, but hidden in the national averages are demographic groups with far less educational opportunities. The following groups tend to be less educated: girls; the poor; rural populations; ethnic minorities; those who do not speak the prevalent or official languages; those in nomadic cultures; the disabled; children with HIV/AIDS; and children in areas of conflict. Children with more than one risk factor are exponentially less likely to go to school. For instance, compared to the total population in countries charted below, poor, rural females are even less likely to have at least 4 years of education.

People With Fewer Than 4 Years of Education

Poor, rural females versus total population. Ages 17 to 22.



Across Asia and the Pacific, Progress and Challenges Vary

Central and West Asia

- Education suffered greatly during the transition to independence in many countries in the early 1990s.
- The late 1990s brought recovery, and the subregion is exemplary in many indicators.
- Quality has not grown with enrollment recovery.
- Issues include class size, teacher competence, time spent in class, and the budget for education.

East Asia

- Remarkably, primary enrollment grew by nearly 500% in the latter decades of the 20th century.
- Retention rates are exceedingly high.
- Quality, relevance, and controlling class size are a concern.
- The People's Republic of China has to contend with a fast-growing school-age population.

South Asia

- Progress towards universal primary education and gender parity is far behind the other Asia subregions.
- About twice as many girls are out of school than boys.
- Low quality of teaching, curriculum, facilities, and other components of education leave parents less inclined to send their children to school.
- Low pay and status stymie teacher recruitment.

Southeast Asia

- Primary education enrollment is exceptionally high.
- Dropout rates are a persistent problem.
- Low pay and status stymie teacher recruitment.
- Efforts to improve pre- and post-primary education are increasing.

The Pacific

- More girls attend school than boys, who drop out at high rates.
- Poor economic prospects make going to school less attractive.
- Quality and relevance of available education are in question.

*Lao PDR = Lao People's Democratic Republic

Subregions in Asia and the Pacific as defined by the Asian Development Bank—Central and West Asia: Afghanistan; Armenia; Azerbaijan; Georgia; Kazakhstan; the Kyrgyz Republic; Pakistan; Tajikistan; Turkmenistan; and Uzbekistan. East Asia: People's Republic of China; Hong Kong, China; Republic of Korea; Mongolia; and Taipei,China. Pacific: The Cook Islands; Republic of Fiji; Kiribati; the Marshall Islands; the Federated States of Micronesia; Nauru; Palau; Papua New Guinea; Samoa; Solomon Islands; Timor-Leste; Tonga; Tuvalu; and Vanuatu. South Asia: Bangladesh; Bhutan; India; the Maldives; Nepal; and Sri Lanka. Southeast Asia: Brunei Darussalam; Cambodia; Indonesia; the Lao People's Democratic Republic; Malaysia; Myanmar; the Philippines; Singapore; Thailand; and Viet Nam.

RESEARCH AND DESIGN: MARK BLACKWELL

World-Class Challenge

Asian nations struggle to create elite universities without leaving behind the millions of their citizens who just need a college education

BY John Otis

To recruit a prestigious Chinese aeronautics professor working overseas, headhunters at Tianjin University went all out. They offered the candidate a competitive salary, top-of-the-line facilities, and other perks. But what sealed the deal was a piece of lab equipment the professor insisted he needed for his research: an airplane. "I was thinking maybe they would buy him a Cessna," says Anthony Welch, a professor of higher education at the University of Sydney who also teaches at Tianjin. "But they bought him a 120-seat jet."

Through an influx of money, top talent, and the occasional airliner, Tianjin University, located 120 kilometers southeast of Beijing, is being groomed for academia's big league. Tianjin is part of the Government of the People's Republic of China's 211 Project which aims to turn about 100 universities, colleges, and technical institutions into elite centers of higher learning. The PRC's push for world-class universities coincides with its rise as a global economic power, yet aspirations of academic greatness are shared by Asian countries of all sizes. Across the region, aging campuses are being razed or refurbished, new facilities are rising, and university recruiters are scouring the globe for the best and brightest scholars.

PICTURE CREDIT: AFP

Highly regarded universities in the PRC, Japan, the Republic of Korea, and Singapore are prompting some Asian students to forego big-name degree programs abroad to study closer to home. They are also convincing expatriates to give up choice academic posts abroad and join their faculties. And by graduating high-level professionals, they are helping to spread and develop new technologies and make the region more competitive.

"In order to fully participate in the global knowledge economy and benefit from science and scholarship, (nations) must have at least one research university that is able to function at a world-class level," writes Philip Altbach, a leading expert on higher education, in a soon-to-be published book, *The Road to Academic Excellence: The Making of World-Class Universities*, edited by Philip G. Altbach and Jamil Salmi.

Still, Asia's quest for quality has been halting and uneven with poor countries floundering and the bulk of the progress registered in richer nations. Even when governments set aside huge sums, creating elite universities "requires a lot more than money," Altbach cautions. "You also need academic freedom, a competitive atmosphere for staff and students, and no corruption."

The challenge is so daunting that some experts argue that low- and middle-income Asian countries would be better served by shoring up their existing higher education facilities. Yet the dream of erecting the next Harvard or Cambridge remains vivid. Like world-class museums, Fortune 500 companies, and Nobel laureates, elite universities are signposts of modernity and shining symbols that nations have come of age.

ACADEMIC ELITE **Former vice-chancellor of Hong Kong's Chinese University Charles Kao receives the 2009 Nobel Prize in Physics from King Carl XVI Gustaf of Sweden. Like Nobel laureates, elite universities are shining symbols that nations have come of age.**

HIGH FLIER **Tianjin University stopped at nothing in luring a prestigious Chinese aeronautics professor back to the mainland, sealing the deal with a pricey piece of lab equipment: a jet.**

LURING ASIAN STUDENTS HOME

Many Ivy League universities built their sterling reputations over centuries. But many Asian nations cannot afford to wait that long because their economies are growing so fast, says Gerard Postiglione, who directs the University of Hong Kong's Wah Ching Center of Research on Education in China. At the same time, improved basic and secondary education in Asia has increased demand for university degrees. By some estimates, half of the enrollment growth at the world's universities over the next 2 decades will occur in India and the PRC—which already has the world's largest enrollment of doctoral students.

For many scholars, becoming more connected to the region and more familiar with its cultures and languages by teaching, conducting research, or earning degrees in Asia suddenly "makes a great deal of sense," Postiglione says. Indeed, some of the brightest lights that Asia lost to the West are now returning to staff the faculties of the most promising universities.

Many Chinese academics have been lured home for the chance to play a role in their country's modernization. Chia-Wei Woo, the first ethnic Chinese to head a major United States university—San Francisco State—left the post to become president of the elite Hong Kong University of Science and Technology (HKUST). Its second

PICTURE CREDIT: AFP

Like world-class museums, Fortune 500 companies, and Nobel Laureates, elite universities are signposts of modernity and shining symbols that nations have come of age

RAISING THE BAR **A researcher conducts an experiment at the Indian Institute of Science in Bangalore. In 2007, Asia produced 22% of the world's total output of published research papers compared with about 28% for the United States, a leader in the field.**

CHANGING VIEWS **A student watches a solar eclipse through a telescope at a university in Seoul. The rise of centers of academic excellence in the region is encouraging Asian students to opt for schools closer to home.**

president was Paul Chu, who received the 1988 National Medal of Science, the highest honor for a scientist in the US. The university's current president, Tony F. Chan, graduated from the California Institute of Technology and Stanford and is a former assistant director of the US National Science Foundation. "They had talent, they had ability, but in the end what brought them here was their hearts," Woo says.

Under their leadership, HKUST offered salaries rivaling those at the world's best universities, put research on an equal footing with teaching, promoted an entrepreneurial approach to development, and appointed highly qualified deans rather than holding campus-wide elections. As a result, it took HKUST just 10 years to reach world-class status: it is currently ranked 41st in the respected *Times Higher Education* survey of the world's best universities.

Some of the same strategies were adopted by Peking University, the National University of Singapore, the Republic of Korea's Pohang University of Science and Technology, and other Asian institutions that have gained international stature. Their campuses are home to a growing number of foreign staff and students. Some institutions are partnering with overseas universities, such as Duke and Johns Hopkins, while the Royal Melbourne Institute of Technology has set up branch campuses in Viet Nam.

Then, there are the region´s research laboratories, which are humming. In fact, Asian scholars are catching up with their US counterparts in the publication of research articles in international journals—a key measure of academic excellence. In 2007, Asia produced 22% of the world's total output of published research papers compared to about 28% for the US, which has long dominated the field. According to William K. Cummings, a professor of international education and international affairs at George Washington University, "The Asian region may be emerging as a new powerhouse of knowledge production."

LOPSIDED ASCENDANCY

But for reasons of both money and mindset, Asia's academic ascendency has been lopsided. In general, developing nations and countries where governments are heavily involved in all aspects of education policy lag behind their more affluent neighbors where universities enjoy a greater degree of autonomy.

Altbach puts the cost of creating an elite university at about $500 million, give or take. Science and technology institutions, Asia's forte, require high-tech laboratories and research facilities and are the most expensive to build. Norman LaRocque, a senior education specialist at the Asian Development Bank (ADB), recalled a proposal by the

PICTURE CREDIT: AFP

government of Pakistan to create nine world-class science and technology universities. Each one would have cost the equivalent of the recurrent budget for higher education. Indeed, the troubling paradox of elite universities is that they can divert resources and water down the quality of a nation's polytechnic institutes and teaching colleges, which may lack status but fill vital roles, says Jouko Sarvi, the practice leader in education at ADB.

True, existing universities can be upgraded or merged. But as anyone who has ever remodeled a house knows, it can be easier to start from scratch. For starters, the influx of huge numbers of students has lowered standards at many universities; thus, the task of remaking them in the image of Princeton University or the Massachusetts Institute of Technology in the US has become even tougher.

Mediocre faculty members must be eased out and replaced with top-shelf professors. The newcomers demand hefty salaries in a region where low wages often force teachers to take second jobs. "It's hard to bring back folks who have earned their doctorates abroad if you are going to pay them one-tenth of what they might earn in a foreign country," Altbach explains.

Asia's leading halls of learning have embraced university autonomy, merit-based hiring and admissions, teaching in English, and foreign-born professors. Still, many governments treat public universities as tools of their social and economic agendas with decisions on hiring, pay levels, curriculum, and work conditions strictly controlled by education ministries.

India's Institutes of Technology (IITs) are more selective than Ivy League schools, accepting just 4,000 students among the 250,000 annual applicants. But political interference and ethnic-based admissions and hiring have seriously eroded the IITs, which now face faculty shortages and are losing promising academics to careers in industries with much higher pay scales.

At the government's behest, the University of Malaysia imposed admissions quotas for ethnic Malays and indigenous people, replaced English with the Malay language, and curbed academic freedom for faculty and students. These policies "have hurt the higher education system, sapping Malaysia's economic competitiveness, driving some (mainly Chinese and Indians) to more meritocratic countries, such as Singapore," according to *The Road to Academic Excellence.* They have also stained the university's reputation. In 2005, it dropped almost 100 places in the *Times Higher Education* ranking, which prompted calls for a royal commission of inquiry and led to the resignation of the university's vice-chancellor.

The rules and regulations can border on the absurd. Writing about Asian research universities, Cummings says some professors must sign in daily to indicate they are on the job and in at least one system they are expected to be at their desks from 9 a.m. to 5 p.m. "The mindset is very much one of government control, and it's a huge barrier when trying to build a world-class university," LaRocque says. "It's no use putting up a nice, big, flash campus if you're not going to allow universities to be autonomous."

Nor will improved facilities make

Some Qualities of a World-Class University

The world's top universities, including stellar institutions in Asia, share many characteristics that allow them to pursue and achieve excellence.

- **Recognized internationally** as a leading research and teaching institution
- **Pursues and hires** the world's top researchers and the best faculty
- **Exceedingly selective** in student admission
- **Highly desirable** among applicants
- **Has many international** students and faculty
- **Produces the best graduates,** with great promise of success
- **Is well-funded,** attracting large endowments
- **Does not draw** from its own graduates to fill positions, avoiding stagnation of ideas and practices
- **Has near-total autonomy,** and is allowed to pursue excellence without interference or direction

Source: Jamil Salmi. *The Challenge of Establishing World-Class Universities.* 2009.

RESEARCH AND DESIGN: **MARK BLACKWELL**

CRUCIAL TEST Asian students have to pass through the eye of a needle, such as a "make-or-break" national college entrance exam, to get into a top university.

PICTURE CREDIT: AFP

much difference if rote learning methods hold sway. Many universities still emphasize memorization, test-taking, and individual problem solving. "This diligent form of bookishness worked well for hundreds of years," Postiglione says. "But with globalization, university learning has to adapt to the changing environment."

He points out that elite universities now stress creativity, critical thinking, problem-based learning, and collaborative practices. "You have to make students much more proactive and involved in their own learning," Postiglione says.

USING PUBLIC MONEY WISELY

The big question for many Asian education experts is what is the best path forward? Does it make sense to devote so much time and energy to so few institutions? Is the quest for world-class universities the wisest use of public education money, especially in developing nations? Low-income countries, still struggling to produce quality national universities for their own people, should be careful about entering the race to attract the world's elite students, say experts.

Instead of overreaching, Asian nations could aim to match the quality of state colleges and the many excellent, if not world-class, private universities in the US, says Emmanuel Jimenez, the World Bank's human development director for East Asia and the Pacific.

"It may be a stretch to duplicate the Ivy League, but other institutions will be much easier to emulate," Jimenez says. "Such a goal is reachable given the resources being spent. And these institutions may provide more appropriate training relative to the local setting and the tasks at hand."

Another intermediate step, says Mark Rosenzweig, a professor of international economics at Yale, is to create excellent undergraduate programs in Asia then look to the US, the United Kingdom, and elsewhere for world-class graduate schools.

Whatever strategy is taken, higher education systems need to be developed in a holistic manner, says Sarvi, not just focused on centers of excellence. "Too often countries focus on that only, and it requires much resources and thus without proper planning can undermine other areas of higher education development," he notes. "Poorer countries in the region may first seek to partner with existing regional centers of excellence, instead of aiming to establish their own as an immediate priority."

Another key step, experts note, is to increase the harmonization of educational credits and degrees in the region, so degrees in one country are recognized in another. These networks are still in their infancy. Even within countries, educational bridges need to be built. One often-cited model is California, where promising students from community colleges can move on to teaching colleges or even to the state's world-class universities. "Not everyone needs to go to Berkeley, but you still have that option if you start out at a smaller college in California because your credits transfer. That's an enormous boost to the system," says the World Bank's Jimenez. "But in many Asian countries, a technical college is considered the track for failed people. It's looked at like the booby prize."

Even if more elite universities emerge in Asia, experts caution that they will not put an end to the flow of academics leaving the region. "Let's imagine you did succeed in creating a world-class university and trained students to be world-class themselves," says Rosenzweig, who has studied migration patterns of university professors and students. "It's not obvious that they will stay home. If a grad school is truly world-class, its graduates will look to the world as their labor market." ■

Asia's Elite

The region is home to 25 of the world s top 200 universities, as ranked by the Times Higher Education.

RANK	UNIVERSITY	LOCATION
21	University of Hong Kong	Hong Kong, China
26	University of Tokyo	Japan
28	Pohang University of Science and Technology	Republic of Korea
34	National University of Singapore	Singapore
37	Peking University	PRC*
41	Hong Kong University of Science and Technology	Hong Kong, China
49	University of Science and Technology of China	PRC*
57	Kyoto University	Japan
58	Tsinghua University	PRC*
79	Korea Advanced Institute of Science and Technology	Republic of Korea
107	National Tsing Hua University	Taipei,China
109	Seoul National University	Republic of Korea
111	Hong Kong Baptist University	Hong Kong, China
112	Tokyo Institute of Technology	Japan
115	NTU	Taipei,China
120	Nanjing University	PRC*
130	Osaka University	Japan
132	Tohoku University	Japan
149	Hong Kong Polytechnic University	Hong Kong, China
163	National Sun Yat-Sen University	Taipei,China
171	Sun Yat-sen University	PRC*
174	Nanyang Technological University	Singapore
181	National Chiao Tung University	Taipei,China
190	Yonsei University	Republic of Korea
197	Zhejiang University	PRC*

PRC = People s Republic of China

Source: *Times Higher Education World University Rankings 2010-2011.* www.timeshighereducation.co.uk/world-university-rankings/2010-2011/top-200.htm.

RESEARCH AND DESIGN: **MARK BLACKWELL**

PICTURE CREDIT: AFP

Cramming in Korea

After achieving great success at promoting basic education, leaders in the Republic of Korea are now trying to become a world-class knowledge center

BY William Branigin

Faced with the devastation wrought by the Korean War and a dearth of natural resources, the Republic of Korea long ago put its stock in education—part of a plan to make the most of its main resource: its people. It had a long way to go. The adult literacy rate at the end of World War II was estimated at 22%.

Today, the Koreans have much to be proud of. Their literacy rate has climbed to at least 98%, and their rankings in tests of reading, mathematics, and science among 15-year-olds are at or near the top of international surveys. Higher education is a top priority for many Korean families, and the percentage of university graduates is among the highest of any country in the world.

But residents of the republic—including educators, parents, and students—tend to take a dimmer view of their education system than many outsiders. High test scores have come at a price, largely attributable to a massive system of private supplementary education that costs the nation's families billions of dollars a year. This system has become so expensive that many Koreans blame it in part for a declining birth rate that now ranks among the world's lowest, posing future problems for the country.

HIGH INVESTMENT **Children participate in a charity event in Seoul. It takes roughly $231,000 to raise one child from birth to college graduation in the Republic of Korea.**

Over the years, hundreds of thousands of Korean families have voted with their feet—or, more precisely, with plane tickets—by sending their children to study abroad in their high school or even elementary school years. Much of this exodus is driven by parents' desire to have their children become fluent

UNDER PRESSURE **A student prays prior to taking the College Scholastic Ability Test, a standardized exam for college entrance, in Seoul. Earning a college degree is a top priority for the Republic of Korea.**

in English, a highly prized ability in a country well aware of its need to compete in a globalized economy. But some seek to free their children of the pressure-cooker atmosphere of the Korean education system, with its overwhelming emphasis on acing standardized, multiple-choice tests. And some now want their children to learn Chinese.

The Government of the Republic of Korea is well aware of its education system's shortcomings and has sought to implement reforms. To combat a flight of resources, relieve some of the financial burden on middle- and low-income families, and avert a brain drain, it has sought to boost English-language instruction at home, improve Korean universities, and nurture what it calls "future Nobel Prize winners."

"In the face of a rather extreme exodus, Korea is desperately making all kinds of efforts to transform the education system" and provide what families are seeking, notably by meeting "an enormous desire for English mastery" that is highly valued in the corporate sector, says Nancy Abelmann, who is Harry E. Preble Professor of Anthropology, Asian American Studies, and East Asian Languages and Cultures at the University of Illinois at Urbana-Champaign.

But the government's reform effort so far has shown no sign of reining in a vast network of private after-school academies known as *hagwons* that impose heavy costs on Korean families, accounting for nearly 3% of gross domestic product.

HIGH TEST SCORES

In its latest global survey, the Programme for International Student Assessment (PISA) of the Organisation for Economic Co-operation and Development ranked the Republic of Korea first among participating countries in reading literacy, second in math (behind Singapore), and fourth in science (behind Finland, Singapore, and Japan). When schools in Shanghai and Hong Kong, China are included—Shanghai took part for the first time in the survey published in 2010—the Republic of Korea drops a bit. Shanghai took first place in all three categories, and Hong Kong, China also topped the Koreans in math and science.

The survey is based on 2-hour tests of 15-year-olds in more than 70 economies. The results have been a source of pride for Koreans in recent

PICTURE CREDIT: AFP

years, and may have contributed to United States President Barack Obama's using the Republic of Korea as an example in several speeches about education. In his first address on the subject after taking office, for example, Obama in March 2009 advocated longer school days and school years, including an expansion of after-school programs. "Our children spend over a month less in school than children in [the Republic of Korea]—every year," he says. "That's no way to prepare them for a 21st century economy. . . . The challenges of a new century demand more time in the classroom. If they can do that in [the Republic of Korea], we can do it right here in the United States of America."

In February 2010, Obama warned, "If India and [the Republic of Korea] are producing more scientists than we are, we will not succeed." And in his State of the Union address in January 2011, he noted that Korean teachers are known as "nation builders."

His remarks, especially his call to emulate longer Korean school days, came as a surprise to many people in the Republic of Korea, where the education system "has been under constant public criticism due to its lack of creativity and heavy dependence on private tutoring," the *Korea Times* newspaper reported.

Foreign teachers in the country concurred. One wrote that Obama appears to have "an absurdly romanticized idea" of the education system in the Republic of Korea. Another blogged that the Korean model should be treated "with way more skepticism" than Obama has shown.

"Even though he's right in some respects, he's not seeing the whole picture," cautioned Paul Z. Jambor, a Canadian lecturer at Korea University in Seoul who has written extensively on Korean education.

They and others worry that high test scores and high-level praise could instill complacency and undercut educational reform efforts.

The public skepticism appears to be widely shared. In its *Global Competitiveness Report for 2010–2011*, the World Economic Forum surveyed 139 economies worldwide and found that, even though the Republic of Korea ranks 22nd overall on a list of a dozen criteria, it drops down the list in educational subcategories measured by domestic opinion polling. In "quality of primary education," for example, the nation ranks 31st—behind six other Asian economies (Singapore; Taipei,China; Japan; Brunei Darussalam; Hong Kong, China; and Malaysia) and three places ahead of the US.

When it comes to the quality of higher education—as evaluated by the local business community—the survey places the Republic of Korea 57th, just above Rwanda. In Asia, eight economies rank higher, led by Singapore (first overall), even though the Republic of Korea by an objective measure has "the highest rate of

TOUGH COMPETITION **An art professor inspects hundreds of drawings and paintings presented by high school graduates as their parents look on during a college entrance exam in Seoul.**

PICTURE CREDIT: AFP

tertiary education enrollment in the world," according to the report.

THE HAGWON SYSTEM

Much of the dissatisfaction with public education in Korea is reflected in the *hagwon* system, a sprawling network of more than 70,000 private, for-profit academies that teach students of all ages. The *hagwons* specialize in helping students boost their grade point averages in their regular public schools and pass national college entrance examinations so they can get into the best universities. Sometimes called "cram schools," they constitute what researchers describe as a supplementary or "shadow" education system similar to Japan's *juku* (tutoring) schools.

Hagwon students typically "study ahead" of the public school curriculum, learning the same material in advance, says Abelmann. This enables them to do well in public school and puts pressure on other families to enroll their children as well so they can compete.

But a *hagwon* can cost up to $1,000 per child a month, and some students end up spending a total of 15 hours a day preparing for their university entrance exams, sometimes getting home well after midnight. Educators say *hagwons* are largely responsible for Korean students' high test scores, but they complain that the academies have also driven many families to the brink of bankruptcy and fostered inequalities that the public education system was designed to prevent.

In the Republic of Korea, Jambor notes that parents spend about 7% of their total income on their children's private education. "Therefore the success of students cannot be attributed to the public school system," he says.

"Relative to the size of the formal education system, the Korean private tutoring system is by far the largest in the world," said the *Asia Pacific Education Review* in a 2010 report.

> ***"Relative to the size of the formal education system, the Korean private tutoring system is by far the largest in the world"***
>
> ***—the Asia Pacific Education Review***

The heavy cost of private education is a major factor in the roughly $231,000 that it takes to raise one child from birth to college graduation in the Republic of Korea. That, in turn, has contributed to the country's declining birth rate, which is among the world's lowest, Koreans say.

"Having to spend an excessive amount on education is one of the basic reasons we can't overcome the problem of low birth rate," and this leads to a higher proportion of elderly people in poverty, Kim Seung Kwan, a researcher at the Korea Institute for Health and Social Affairs, recently told Singapore's Channel NewsAsia television network.

EDUCATIONAL EXODUS

A complementary phenomenon in Korean education has been what educators have dubbed "early study abroad," also known as pre-college study abroad (PSA), the practice of sending high school or even elementary school students overseas, largely to learn English.

Between 1998 and 2008, the number of Korean PSA students increased 17-fold, to more than 27,000 a year, even though the overall number of elementary and secondary school students declined, according to a study published June in the *Journal of Korean Studies.* Nearly half the 2008 total went to the US, says the study by Abelmann and University of Iowa Assistant Professor Jiyeon Kang. It notes that the numbers of PSA students may be higher when "unreported, unsanctioned" students are factored in.

"It is not an exaggeration to say that this PSA growth signaled a veritable educational, economic, and national crisis with so many youth exiting with their skills, money, and even possibly their futures," Kang and Abelmann say.

Since 2009, the numbers are believed to have dipped because of the global economic crisis, and new destinations have taken root. "The PSA center of gravity has shifted very dramatically away from North America toward Southeast Asia," the study says. According to Abelmann, instead of going to Australia, New Zealand, and the US, more than half the Korean students doing pre-college study abroad are now landing in Asian countries where English is widely spoken, including Malaysia, the Philippines, and Singapore, in addition to India.

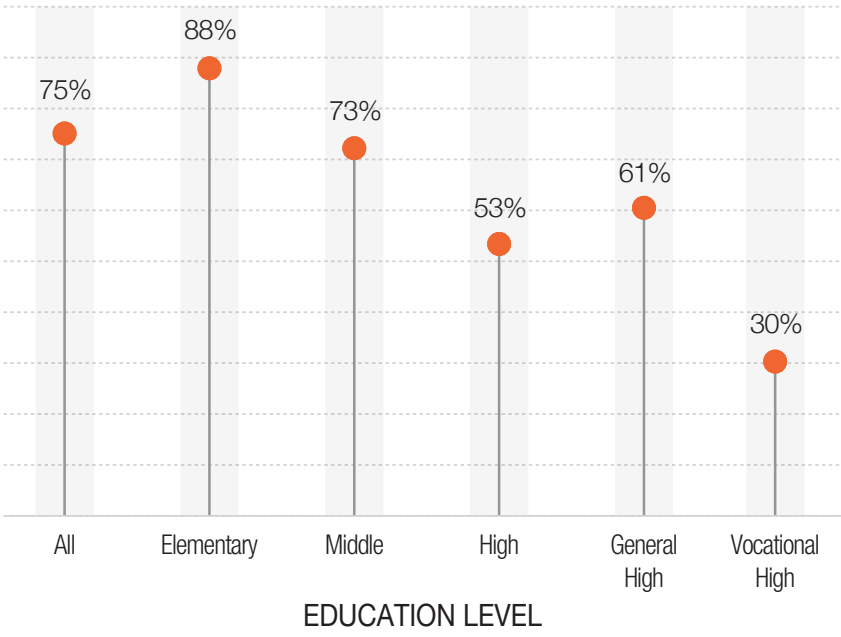
"Some people are saying, 'forget English, the language of competition is Chinese,'" Abelmann says. The result is an increase in Korean students studying at pre-college and university levels in the People's Republic of China, she says. Other families seek the best of both worlds, sending their children to Singapore, where they can study English and Chinese—both official national languages.

The practice has led to what Koreans call "geese families," with the father staying home to work while the mother accompanies the children and lives with them abroad. This imposes social costs, as well as the hardship of having to spend large sums of money to maintain two residences.

Despite the downsides, early study abroad is so prevalent that it has become "an extension" of the educational system and social

Private Education

The number of pupils participating in private education is shown as a percentage of all pupils in each grade level. The average for all levels is 75%. Nearly 9 out of 10 elementary students participate as do 1 out of 2 high school students. However, fewer than one in three vocational high school students participate.



Source: *Statistics Korea. The Survey of Private Education Expenditure. 2008 and 2009. http://kostat.go.kr/portal/english/news/1/8/index.board?bmode=read&aSeq=67002*

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stratification in the Republic of Korea, Kang and Abelmann argue in their study.

REFORMS

Faced with the heavy burden of hagwons and the educational exodus, the government of President Lee Myung-bak has sought to implement various reforms aimed at providing more opportunities in the Republic of Korea and reducing the cost of shadow education.

"English villages" have been set up to provide students with short-term, live-in immersion environments to learn English. Foreign universities such as the University of North Carolina and the State University of New York at Stony Brook are opening branch campuses in the Incheon Free Economic Zone. And there are plans to establish branches of a dozen US and British private high schools in the government-funded Jeju Global Education City on Jeju Island by 2015, according to Kang and Abelmann.

In an effort to "create an educational environment that doesn't depend so much on private education," President Lee also wants Korean public school teachers to "teach English in English" in middle school and high school, Jambor says. This is also aimed at improving Korean students' English communication skills, which educators say are quite low despite the large amount of time devoted to English classes in public schools.

But some Korean teachers, especially older ones, have been resistant to such changes, forcing the government to scale back the plan, Jambor says. Another plan, called the "Brain Korea 21" project, is going ahead, however, with the aim of "making South Korean universities more competitive and thus world-class universities," Jambor says.

While it may be unrealistic to directly target the *hagwon* system for swift reforms, given its significant contribution to the country's economy, the effort to raise the profile of Korean universities appears to be bearing fruit. In the *2010–2011 World University Rankings*, published by the United Kingdom's *Times Higher Education*, the Pohang University of Science and Technology vaulted to 28th place among nearly 200 schools, the highest ranking to date on a list long dominated by US, British, and other European universities. The top Korean university in 2009 was Seoul National University, in 47th place.

"We're ahead of schedule," Pohang President Sunggi Baik told the Washington-based *Chronicle of Higher Education* recently, noting that his own timetable put the university in the top 50 by 2015. With a $2 billion endowment fund, a relatively small enrollment of 2,700 of the country's brightest students, and a policy of attracting faculty from all over the world, Pohang recently became only the second Korean university to begin a transition to an all-English system, the *Chronicle* reported.

Now Baik hopes to crack the top 20 on the *Times Higher Education* list by 2020. Meanwhile, Pohang's jump to 28th—from 134th the year before—"gives us more visibility," Baik said. "It's a phenomenal boost." ■

Windfall Schools

Mongolia enjoys high enrollment rates in lower schools and colleges, but major education challenges remain as this resource-rich nation prepares to become a bigger player in international commodities

BY Floyd Whaley

In Mongolia's eastern Gobi Desert, Tserenlkham, the friendly and talkative director of Sainshand School No. 2, darts from room to room talking to teachers and students, and proudly describing the facility she oversees.

"These are the most up-to-date anatomical models," she says while visiting a biology class where students have removed the organs from a model of the human body and are writing in their notebooks.

In another class, she shows off the latest ergonomic chairs for preschoolers. The children previously were using uncomfortable oversized chairs designed for older students. The classroom is bright and well-decorated, with audiovisual equipment to enhance the lessons.

"This is their first exposure to school," she notes. "If they have a positive experience here, there is a greater chance that they will stay in school longer."

In another part of the school, she shows off a new computer lab where students are doing research and teachers are downloading materials to support their class work. Not long ago, these same teachers were relying solely on outdated Russian textbooks.

What is taking place at this windswept school in the Gobi Desert is a dramatic change from the way students have been taught in Mongolia for decades. While the country was associated with the former Soviet Union, rote memorization in grim facilities was often the order of the day.

AN OASIS OF LEARNING **Sainshand School No. 2 in the eastern Gobi Desert serves as a model for Mongolia's campaign to improve the quality of education.**

The challenge today, say experts, is spreading the type of success that Sainshand School No. 2 has enjoyed.

A STORIED PAST

The accomplishments of Mongolia's early leaders are required reading not only for people here, but also for students worldwide. It is also a country that has undergone dramatic changes throughout its society since the early 1990s and is facing a crucial test in the decade to come.

Mongolia has enjoyed fast economic growth; yet like many countries around the world, it was also hit hard by the recent global economic downturn. With support from international donors, a rebound is under way. Gross domestic product grew by 5.0% in the first half of 2010, coming out of a 1.6% contraction in 2009, according to *Asian Development Outlook 2010,* a publication by the Asian Development Bank (ADB)." The country's economy is predicted to expand by 6.5% in 2011.

Economic growth is driven primarily by mining, in particular the massive Oyu Tolgoi project, which is expected to be one of the world's most prolific copper and gold mines when it starts production in 2013. The country also benefits from its location between the economic powerhouses of the People's Republic of China and the Russian Federation.

The country has used revenue from rapid growth in part to finance an impressive campaign to build schools. Like many countries in the region, Mongolia has enjoyed incredible success in boosting primary and secondary enrollment. More than 90%

PICTURE CREDIT: KEVIN HAMDORF

NEW DIRECTIONS **Tserenlkham, director of Sainshand School No. 2, says the school seeks to give students a positive learning experience through modern teaching methods and facilities.**

SMART FUN **Unlike the grim classrooms of old, Sainshand School No. 2 provides preschoolers with a bright and well-decorated environment conducive to learning.**

ONLINE SUPPORT **At the new computer lab of Sainshand School No. 2, teachers support their class work with research materials available online.**

of primary-aged students are enrolled in school. Literacy is near universal.

While nationwide enrollment rates are high, many children in rural areas still do not attend primary or secondary school. In the countryside, 8% of children aged 7 to 15 have never enrolled in school. Another 19% drop out before completing grade 8, according to a report by the United Nations Country Team in Mongolia.

In addition to the challenges associated with the urban–rural divide, many schools in Mongolia do not offer the updated facilities and modern teaching perspective of the school in Sainshand.

"The school curriculum and teaching methods have not kept up with new demands in the labor market," notes an August 2009 report by ADB on the impact of the financial crisis on Mongolia's education system. "The curriculum continues to be by rote, too theoretical, and focused on traditional academic subjects, while teaching continues to be teacher-centered rather than interactive. Classroom instruction encourages memorization rather than critical and creative thinking, and individual learning rather than teamwork."

Ironically, Mongolia's greatest challenge—and a key issue for the development of the country's education system—is the prospect of vast wealth. Sitting on some of the greatest mineral deposits in the world, Mongolia has confirmed deposits of nearly every major valuable mineral resource: coal, copper, fluorite, gold, iron ore, lead, oil, phosphates, tin, uranium, and others. The Oyu Tolgoi mine project alone is expected to generate up to $50 billion in revenue over the next 50 years.

In the countryside, 8% of children aged 7 to 15 have never enrolled in school. Another 19% drop out before completing grade 8

—report by the United Nations Country Team in Mongolia

Mining Mongolia's vast mineral deposits will encourage new investment, create jobs, generate export income, and produce a surge in government revenue that can be used to fund social and development spending, including investing in upgrading the country's education system.

On the downside, this windfall of revenue and investment is likely to increase demand for labor far beyond Mongolia's capacity, and produce higher incomes and public spending that could send the country's inflation skyrocketing into double digits. It also may keep the economy narrowly focused on extractive industries and leave it susceptible to "boom and bust" cycles related to swings in global commodity prices.

SKILLS SHORTAGES AND MISMATCHES

A key challenge for Mongolia's education system, which the government has recognized in its planning documents, will be to produce graduates who can address the skills shortages and mismatches

PICTURE CREDIT: KEVIN HAMDORF

"Mongolia has challenges in the education sector, but its government has been highly committed to improving this sector, by introducing various reforms and also providing subsidies such as free textbooks targeted at disadvantaged children, free school snacks, and free kindergarten meals"

—Jazira Asanova, an education specialist at the Asian Development Bank

TAPPING RESERVES **Resource-rich Mongolia is banking on mining projects, such as the Oyu Tolgoi project, to boost economic and social investment possibilities in the country.**

that affect nearly all sectors of the country's economy.

The country was successful at dramatically boosting the number of higher education institutions, such as colleges and technical schools, in part by allowing private schools, which were banned under the socialist system. At the start of transition to democracy, there were only 14 state-owned higher education institutions. By 2010 there were 146 higher education institutions, including 5 branches of foreign universities. Over the same period, the number of students increased to about 164,700 from 20,000.

The rapid increase in the number of public and private higher education institutions since 1991 was fueled by demand and was largely uncontrolled, notes an analysis of the higher education sector by ADB.

The report states that only about half of private higher education institutions have been accredited, and their management and finance have not kept pace with growth. The government has responded with a plan to consolidate public higher education institutions from 42 to 16 with the aim of concentrating its resources on fewer, but higher-quality and better-managed institutions.

"While student enrollment in degree programs has been steadily increasing, there is no evidence that the quality of the programs has improved," says the report. "Rising demand for higher education apparently is not driven by quality considerations and neither does it serve as an incentive for higher education institutions to improve the quality of their programs."

Higher education institutions in Mongolia suffer from a proliferation of small private campuses without quality control, a weak accreditation system, too few teachers, poor research capability and inadequate research facilities, and weak networks and partnerships with regional and international universities, among other problems.

In addition, the report notes, "It is generally acknowledged among higher education institution administrators, employers, and students themselves that the majority of graduates do not have the knowledge and skills required by the labor market. As a result, many graduates end up unemployed."

Mongolia's higher education institutes also suffer from a lack of equity and access. Poor and rural residents often end up excluded from college or technical school, a situation exacerbated by inadequate state grant and tuition loan programs.

"Mongolia has challenges in the education sector, but its government has been highly committed to improving this sector, by introducing various reforms and also providing subsidies such as free textbooks targeted at disadvantaged children, free school snacks, and free kindergarten meals," says Jazira Asanova, an ADB education specialist who works in Mongolia. "Reforming the curriculum and improving teaching methods are ongoing efforts."

PICTURE CREDIT: AFP

BREAKING THE MOLD **Standing out amid the nearly all-male class is Enkhbolor, a tiny 18-year-old who is the only woman in the class. She says she chose to study masonry because of the construction boom in Mongolia.**

The reform effort is mapped out in a broad national strategy, but also with what the Government of Mongolia calls the Campus Development Plan, which establishes enclaves that would serve as "townships of intellect." The plan, approved by the government on in June 2010, initially identifies six locations to be developed into world-class institutions of higher education. More campuses will be added as the plan is carried out from 2010 to 2021 with both public and private funding, notes the education sector analysis by ADB.

While these broader national strategies get underway, some educational institutions in the country are already responding to the demand for certain skills. At a technical school in the Gobi Desert town of Sainshand, a group of students lay bricks as Naranchimeg, the teacher of the masonry class at the Professional Training and Production Center, notes that jobs in construction are in high demand in Mongolia. The demand is easily confirmed with a walk down any main street in any Mongolian city. Construction projects seem to dot nearly every block.

"We are teaching them how to build buildings, how to lay bricks properly, so they can work as all-around construction workers or as contractors," says Naranchimeg. "Construction is a booming industry in Mongolia right now and there are not enough Mongolian contractors to fill the jobs. All of these students will have good jobs when they graduate."

Standing out amid the nearly all-male class is Enkhbolor, a tiny 18-year-old and the only woman in the class. She is taking the lead in her bricklaying group. She says she chose to study masonry because of the construction boom in Mongolia.

Like Mongolia—a nation of approximately 3 million people situated among larger countries—she is confident that she has what it takes. "I'm small but I'm strong." she says. "I can do it." ■

SAVED BY THE BELL **Students wait for their next class at a technical school in the Gobi Desert town of Sainshand.**

PICTURE CREDIT: KEVIN HAMDORF

The Big Mismatch

Asia needs to train workers for the jobs of the future. Is vocational education the solution?

BY Bruce Heilbuth

For more than 10 years Stephen Naromal ran real estate and construction companies in the Philippines, and hiring people was part of his role. One of the most memorable aspects of his work then was the number of applicants he rejected because of the divergence between their skills and educational backgrounds and what jobs required.

"There were just so many mismatches!" he says. So many that on some occasions he took on people with completely unsuitable curricula vitae—simply because they seemed bright and talented.

This common difficulty in fitting people to positions in Asian countries is compounded by salaries that are often so low at home that many graduates and people already in stable jobs quit the country to work abroad, Naromal says. That's what happened in his case: he emigrated to Canada because he could earn over 11 times more there doing similar work.

Some simple economic and demographic factors drive this

MONEY ON THE RUN **A woman sits next to a billboard advertising remittance services from abroad at an airport terminal in Manila, Philippines. The long-term economic and social effects of exporting labor are debatable.**

PICTURE CREDIT: AFP

migration. In developing economies, people eager to work seek the best salaries and jobs wherever they can find them.

However, as so-called "Asian tiger" economies continue to expand and their hunger for new labor skills grows, it is becoming increasingly evident that skills mismatches—having too few or too many workers with specific training or skills in particular areas—are an added potential drain on economies and are fuelling inefficiencies in companies and bureaucracies.

"There's a mismatch in all labor markets in Asia," observes Alberto P. Fenix Jr., president emeritus of the Philippine Chamber of Commerce and Industry.

The Organisation for Economic Co-operation and Development (OECD) noted in a 2009 report that the problem is complex, regional, and potentially volatile.

"Across the region, population growth, combined with migration from rural to urban areas and increased urbanization, has resulted in large pools of semi- and unskilled workers, many of whom are unable to integrate socially, politically, or economically into mainstream society," states the report *Employment and Skills Strategies in Southeast Asia Setting the Scene*. "The failure to provide this group with the appropriate skills, or support the upgrading of their existing ones, represents a loss of potential talent across a generation and could lead to political discontent."

SKILLED LABOR **Need abounds for vocational education programs designed to produce skilled workers for high-growth fields in the region, such as construction, mining, and information and communication technology.**

PICTURE CREDIT: AFP

"Across the region, population growth, combined with migration from rural to urban areas and increased urbanization, has resulted in large pools of semi- and unskilled workers, many of whom are unable to integrate socially, politically, or economically into mainstream society"

— Organisation for Economic Co-operation and Development

Ernesto M. Pernia, professor of economics at the University of the Philippines and a former lead economist with the Asian Development Bank (ADB), agrees. "The supply side just hasn't been able to adjust quickly enough to meet the changes on the demand side, and educational systems can't readily cope."

DEMAND IMBALANCES

Inadequate investment in human capital fuels labor supply–demand imbalances in, among others, Bangladesh, Cambodia, Indonesia, the Lao People's Democratic Republic, Nepal, Pakistan, the Philippines, Sri Lanka, and—to a lesser extent—Thailand and Viet Nam, says Pernia. India may not have the problem to the same degree because many Indians have been trained overseas, especially in the United States, and are returning to meet the expanding demand for skilled labor.

One result of skills mismatches is a talent drain that has long-term adverse impacts on less advanced Asian countries seeking to meet the Millennium Development Goals. Why? Because this kind of migration can compromise countries' human capital requirements for long-term development, says Pernia.

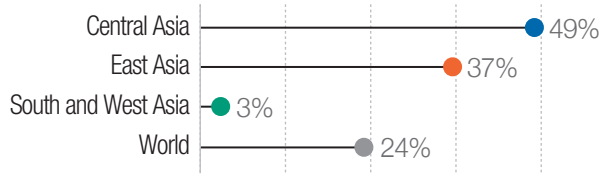
True, a remittances bonanza usually results from such migration, but that makes it convenient for governments "to skirt the difficult task of policy reform needed to strengthen

Vocational Education

In most of Asia, upper-secondary students enroll in technical and vocation programs at rates well above the global average.

Enrollment Rates at the Upper-Secondary Level

Percentage of upper-secondary students in technical and vocational programs, regional averages, 2008



Source: United Nations Educational, Scientific and Cultural Organization Institute for Statistics. *Global Education Digest 2010: Comparing Education Statistics Across the World.* Montreal: UNESCO Publishing, 2010. http://www.uis.unesco.org/template/pdf/ged/2010/GED_2010_EN.pdf

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the performance of the domestic economy," Pernia writes in a recent *Philippine Daily Inquirer* article.

Many of the Asian migrants who market their skills outside their home countries include the most experienced and educated workers, according to Pernia. This means their departure results in a disruption of economic activity, and in turn impacts the quality of goods and services. "A deterioration in quality is not unusual. You see it, for example, in the quality of education and health services in our country when able teachers and health workers leave."

WEAK INSTITUTIONS

Another reason for skills mismatches in Asia may be generally weak labor market institutions (LMIs). According to the OECD report, LMIs cover a range of activities and services, including employment services, career guidance, and information about job opportunities. "One of the most important constraints facing Asian labor markets is the lack of effective employment services," it says.

> ***"We still have skills gaps and a lot of unfilled job orders"***
>
> **—Nimfa de Guzman, a director of the Philippines Overseas Employment Administration**

Nimfa de Guzman, a director of the Philippines Overseas Employment Administration, a government agency that promotes and monitors employment for expatriate Filipinos, is aware of how services that aim to get people into work can misfire. Part of the agency's strategy is to hold job fairs around the country to bring employment opportunities with private companies and public services closer to the people. But the results are disheartening: the fairs meet just 1%–2% of the organization's labor demands. "We still have skills gaps and a lot of unfilled job orders," says de Guzman.

The solution is no quick fix. As with most intractable problems in developing nations, the best hope for the poor and jobless in the long run—almost all economists, industrialists, and academics agree—lies primarily in aggregation of economic wealth and better-tailored education that (in particular) embraces new technologies and focuses on vocations to meet immediate and specific labor-market needs in the public and private sectors.

Fortunately, over the next decade, expanding and strengthening education will be a priority concern in nearly all developing countries in Asia, according to a recent ADB report. Indeed Asian governments face strong social demand for expanded access. Encouragingly, almost all these countries seek to incorporate advances in information and communication technology to improve delivery of higher education. This will help ensure more people are better attuned to opportunities in the labor markets.

In this scheme, targeting training regimes to skills in demand is as important as increasing access to training, if not more so. In fact, the OECD reports concludes from countries' experiences that training alone without strict attention to quality and relevance will, in most cases, result in disappointing employment outcomes.

"There is a need to raise the scale of training delivered (i.e., quantity) as well as the relevance of training to the demands of the private sector, the suitability of training for emerging categories of workers, such as women, and the certification of training where

REVERSE BRAIN DRAIN **Workers assemble India's Tata Nano, said to be the world's cheapest car, in the western state of Gujarat. The country's economic success is encouraging many Indians trained overseas to return.**

possible (i.e., quality)," the report states.

"In most countries across the region it would take 5 or more years to enable public vocational education and training (VET) institutions to deliver skills that are attractive to employers. Under such circumstances it is necessary to investigate what role private providers and companies can play in expanding the supply of skills, as well as what incentives are required to encourage such provision."

A clear benefit of vocational education is that it can be tailored precisely to labor market needs—such as increasing programs in construction and mining trades in recognition that these will be the source of many high-demand jobs in years to come. To take one example among many, the Oyu Tolgoi copper mine in Mongolia recently announced it would spend around $3 million on vocational training for some 3,300 residents over the next 3 years.

Another step to rectify the mismatch between skills acquisition and business needs in the region is the provision of an "enabling environment," says the OECD report, so the supply of skills is balanced with the provision of opportunities to use them.

For this reason, vocational skills development should be integrated with employment promotion for both the formal and informal private sectors. "In particular, international cooperation in developing an enabling environment for micro- and small enterprises is of critical importance."

Many Asian nations are trying to avoid hard lessons that may imperil their growth prospects. The development trajectory followed by the Southeast Asian tigers, in particular, provides lessons on strategies for creating decent and productive employment, according to the OECD's report.

One of the tenets is the need to have an industrial policy that targets growth in sectors with the greatest employment potential. Such a policy makes it easier for governments to ensure a match between the demand and supply of skills.

Viet Nam provides a good example of how skills mismatches can be minimized to reduce poverty. The country's economic growth achievements in the past 15 years are a great success story, according to ADB. In 2007, for example, Viet Nam absorbed 46.11 million workers after creating 11.39 million new jobs in the previous decade.

What is Viet Nam doing right? Its industrial policy has successfully targeted dynamic growth sectors. In its powerful manufacturing segment, continued growth has been identified in electro-mechanical industries, shipbuilding, textiles, food processing, petrochemicals, and tourism. Information and communication and "professional, scientific, and technical activities" are still small but growing fast and reinforce the government's prioritization of high technology, including new materials technology, biotechnology, automation technology, and nanotechnology.

While the country still has problems finding skilled labor, a step in the right direction may be a law passed 5 years ago that sets out state policies on VET development. The law supports the expansion of the VET system to supply human resources and more advanced training to modernize and industrialize the nation. It also aims to raise teacher qualification requirements and encourage local and foreign individuals and organizations to set up vocational training institutions. It also consolidates responsibility for VET under a central agency.

Ultimately, as ADB's report indicates, governments should recognize the economic and social returns of investment in education, and seek assistance in optimizing that investment. In ADB's developing member countries, "the increasingly complex demands of globalization require that attention be shifted beyond basic education to technical and vocational education and training, and to higher education." ■

PICTURE CREDIT: AFP

Consumptionomics

Asia's Role in Reshaping Capitalism and Saving the Planet

By Chandran Nair
John Wiley & Sons (Asia)
February 2011. $27.95

The recent financial crisis has seen the West's leading economists and policy makers urging Asia to make a conscious effort to consume more and thereby help save the global economy.

Consumptionomics challenges this view. It contends that if Asians were to achieve consumption levels taken for granted in the West, the results would be environmentally catastrophic across the globe. Moreover, it would have significant geopolitical impacts as nations scramble for diminishing resources.

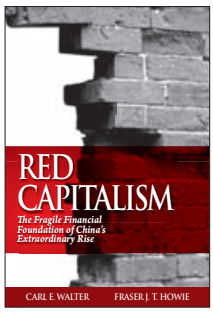
"His book is a call for Asia's developing nations to eschew consumerism and adopt a more ascetic economic model that will deliver sustainable development and save the planet from environmental disaster."—Hugh Carnegy, *Financial Times*

Chandran Nair "questions the assumptions that everyone in [the PRC] and India should—or needs to—have a car, live and work in air-conditioned buildings, and consume food and goods shipped from everywhere in the world. He argues that Asian capitalism must be reshaped for a resource-constrained world rather than be replaced."—John Vidal, *The Guardian* ■

Red Capitalism

The Fragile Financial Foundation of China's Extraordinary Rise

By Carl E. Walter and Fraser J. T. Howie
John Wiley & Sons (Asia)
February 2011. $29.95



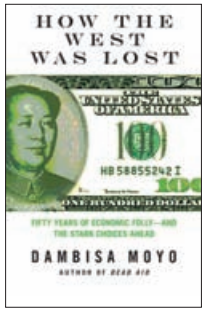
Red Capitalism examines the fragile banking system that threatens to undermine the sustainability and success of the People's Republic China (PRC) on the global stage. It traces how the government reformed and modeled its financial system in the 30 years since it began engaging with the west.

Authors Carl E. Walter and Fraser J. T. Howie, both investment bankers, believe that understanding the institutional arrangements in the finance sector is key to understanding the PRC's emerging role in the global economy. Their analysis shows how the government's response to the global financial crisis has created a banking system whose stability can be maintained only behind the walls of a nonconvertible currency, a myriad of off-balance sheet

How the West Was Lost

Fifty Years of Economic Folly—and the Stark Choices Ahead

By Dambisa Moyo
Farrar, Straus and Giroux
February 2011. $25.00



Economist Dambisa Moyo, author of bestseller *Dead Aid: Why Aid is Not Working*, takes up one of the brewing issues in the world today: the shifting of economic power from the West to the East.

The resiliency of the People's Republic of China (PRC) and emerging economies in Asia in the face of the recent financial crisis has enabled the East to get back on track toward growth, leaving the still troubled economies of the United States and Europe in the dust. Talk is rife that the PRC, now the world's second biggest economy, will eventually overtake the US, and that the renminbi will replace the US dollar as the international reserve currency.

Despite the book's title, Moyo hardly concedes that the US has already lost the battle. What she does is point out how shortsighted policies and decisions, such as putting too much confidence in market mechanisms, have created the morass of debt and deficiencies in the country. At the same time, she rallies the US to take drastic measures, if necessary, to resuscitate the economy.

"What are we to make of the Moyo thesis? Inevitably, in a short book of such a sweeping nature, there are many hostages to critics. I will let these pass. I do not share Moyo's pessimism, but I applaud her brave alarum against our economic and social complacency: her core concerns are sufficiently close to painful truths to warrant our attention."—Paul Collier, *The Observer*

"The backbone of this book, and the best reason for reading it, is her examination of how the US has lost economic ground by grossly misallocating capital, labor, and technology."—James Pressley, Bloomberg ■

arrangements with nonpublic state entities, and the strong support of its best borrowers—the so-called "national champions"—who are the greatest beneficiaries of the financial status quo.

Walter has worked in the PRC's finance sector for 20 years, holding senior positions in investment banking.

Howie has been trading, analyzing, and writing about Asian stock markets for nearly 20 years.

"*Red Capitalism* shines an unprecedented light on a remarkable effort to build a system that appears to be comprised of sophisticated companies and markets. But the book also shows that a more primitive system, with vices as well as virtues, lives behind this facade. There is enough in *Red Capitalism* to provide [PRC] bulls with facts to justify enthusiasm for all that has changed, and yet still leave them wary of the future."—*The Economist*

The authors "argue that [the PRC] isn't so different from other economies nor so immune from normal economic laws as cheerleaders argue. An examination of the financial system—or 'how [the PRC's] political elite manages money and the country's economy,' as the authors put it—offers a useful lens through which to view much broader issues."—Rick Carew, *The Wall Street Journal* ■

The Price of Everything

Solving the Mystery of Why We Pay What We Do

By Eduardo Porter
Portfolio/Penguin
January 2011. $27.95

The book starts with a simple premise but ends by making readers more conscious of what influences the value they place on the most mundane to the most important elements of their lives.

Author Eduardo Porter explores the story behind how the world gives a price to everything, not just commodities but also human life. He asks provocative questions, such as why pay $2.29 for coffee at Starbucks when one can get the same brew elsewhere for less than a dollar, why polygamous societies place a higher value on women than monogamous ones, and why some government agencies consider a year of life for a senior citizen four times more valuable than that of a younger person.

Porter began his journalism career as a financial reporter for the Mexican government news agency Notmex in 1990. He began at the *The New York Times* in 2004, covering economics, and later joined the paper's editorial board in 2007. He graduated from the Universidad Nacional Autónoma de México, then went on to earn a master's degree in quantum fields and fundamental forces from the Imperial College of Science, Technology and Medicine in London.

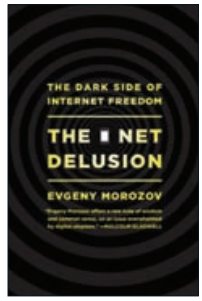
Porter "introduces a prosaic yet surprisingly vital lens for examining our connected world: prices. Porter uses prices to highlight the economic component of our choices. This proves a surprisingly fruitful strategy that's only enhanced by the author's first-rate storytelling and muscular prose."—*Harvard Business Review* ■

The Net Delusion

The Dark Side of Internet Freedom

By Evgeny Morozov
PublicAffairs
January 2011. $27.95

With uprisings in the Middle East and Africa being Twittered and blogged 24/7 to garner international support, publishing a book on the democratizing power of the internet at the start of the year could not be more timely.



The *Net Delusion* however offers a different view from popular opinion. The author, journalist and social commentator Evgeny Morozov, seeks to dispel the notion that the internet and social media are liberating by nature. These tools are available not just to those who fight for democratic reforms, but also to those who stifle freedom and social change. At the hands of authoritarian governments, the internet could be used to disseminate propaganda and spy on enemies.

Morozov is a contributing editor to *Foreign Policy* and *Boston Review* and a Schwartz Fellow at the New American Foundation, which is dedicated to exploring innovative solutions to the world's most pressing problems.

"His book is about the dangers of a particular form of vanity, whereby earnest, well-meaning commentators and policy makers in Washington and Silicon Valley convince themselves that their high-technology tools can liberate those living under political repression." —*Joshua Yaffa, The Wall Street Journal*

"Morozov convincingly argues that, in freedom's name, the internet more often than not constricts or even abolishes freedom."—*The New York Times* ■

Aid on Trial

In the past 5 decades, the developing world has received some $2.3 trillion in aid in today's US dollar equivalent. Has it helped, and without it, would the poor be even poorer? Or has it made things a whole lot worse? In a special two-part report, *Development Asia* presents the cases for and against more aid

BY Bruce Heilbuth

PART 1 THE CASE FOR MORE AID

SHOW THEM THE MONEY

Sajida Khari Mohammad lives in a two-room house in Karachi's Bhainse Cattle Colony. The colony is known for its overpowering stench of cow dung, but the 18-year-old has no complaints. Having migrated to Karachi from a village in the Pakistan province of Sindh, she prides herself on being a "pillar for her family".

Sajida works in a garment factory producing uniforms for Marks & Spencer, Tesco, and Sainsbury's in the United Kingdom. The money she earns helps to support her eight siblings and provide medication for her chronically ailing father, all of whom have moved to Karachi.

Learning a new skill has been empowering for Sajida. "After I finish 3 months in training, my income will increase by more than 50%," she says. "The most exciting part is I'll be able to make all kinds of garments."

Sajida is one of 235 "master trainers" who have benefited from a project known as Gender Promotion in the Garment/Clothing Sector through Skills Development. It is a joint effort of the United Nations Development Programme and a local garment manufacturers' body.

Like hundreds of similar programs across Asia that owe their existence to the Millennium Development Goals (MDGs)—the worldwide initiative to end poverty by 2015—it would have been impossible, literally, without foreign aid money.

> ***"Poverty is a social construction. Humans made it, so humans can undo it"***
>
> **—James Arvanitakis of Aid/Watch, which monitors Australia's aid and trade programs**

Hard cash from the world's wealthy nations funneled through the United Nations and other agencies is the simple recipe the world needs to rid itself of the most extreme forms of poverty, according to some influential thinkers.

While few believe *relative* poverty can easily or ever be eradicated, this body of opinion insists the world's 1 billion poorest individuals—those who live on less than $1 a day—can, with

HUNGRY FOR AID Flood victims in Pakistan gather at a distribution point for relief goods.

PICTURE CREDIT: AFP

the help of judicious cash donations, rise above subsistence and achieve control over their economic futures and their lives.

"Poverty is a social construction," says James Arvanitakis, a lecturer at the University of Western Sydney and a management committee member of Aid/Watch, an independent monitor of Australia's aid and trade programs. "Humans made it, so humans can undo it."

The chief international spokesperson, arguably, for proponents of more aid is Jeffrey Sachs, an American economist and director of the Earth Institute at Columbia University, who in his celebrated 2005 book, *The End of Poverty: Economic Possibilities for Our Time,* proposed nine steps to eliminate extreme poverty by 2025.

To accomplish this, Sachs says, aid must be raised to $195 billion a year by 2015 from $65 billion in 2002.

An essential plank of his argument that more cash can rescue the poorest of the poor is that in countries such as Bangladesh and Nepal, where tens of millions live in poverty, all existing capital is consumed simply to stay alive.

Meanwhile the extreme poor are getting poorer because the amount of capital per person is decreasing due to population growth or environmental degradation, according to American social commentator Eric Austrew.

"The problems I had always thought of as the key factors to helping these countries, such as less corruption, better governance, or culture factors like women's rights, are not at the root of poverty," writes Austrew. "I am convinced it is possible to have a perfectly governed, free, and equitable country that is nonetheless doomed to unending poverty and suffering."

Nevertheless it is true that the *proportion* of very poor people is shrinking. Today, the number living in extreme poverty, the World Bank estimates, is 1.1 billion, down from 1.5 billion in 1981. In the Peoples' Republic of China and India alone, the economic boom in East and South Asia has lifted 300 million people out of extreme poverty.

This is laudable progress, yet one-sixth of humanity still suffers the

SLEEP SAFE Mosquito nets hang above the beds in the children's ward at government-run Ifakara Health Institute in Bagamoyo, Tanzania. International aid has made a difference in the fight against malaria, particularly in Africa where, until recently, more than 1 million children suffered from the disease each year.

PICTURE CREDIT: AFP

ravages of AIDS, drought, isolation, and civil wars, and is trapped in a vicious cycle of deprivation, says Sachs, writing in *Time* magazine. These people lack roads, trucks, irrigation channels, and power. Because they need every bit of money they have to stay alive, they have no way to save.

REACHING THE BOTTOM RUNG

A major problem is the inability of very poor countries to reach the bottom rung of the ladder of economic development to make these necessities available. Once the bottom rung is reached, with the help of outside aid, a country can pull itself up into the global market economy, and the need for assistance will be diminished or eliminated, say proponents of more aid.

There is plenty of evidence that such outside cash help can be very beneficial. In the treatment of malaria in developing countries, for instance, aid has made a demonstrable difference.

Until recently, more than 1 million African children succumbed to the disease each year. International funding for malaria increased from $0.3 billion in 2003 to $1.7 billion in 2009. The net result is that malaria cases in 38 dropped by more than 50% by 2008, as compared with 2000 figures, according to Sithara Batcha, an aid professional based in Geneva, Switzerland.

Batcha has worked in Tanzania and seen the dramatic effects of increased development aid in the island of Zanzibar. When she arrived there in 2005, hospital beds were filled with children suffering from malaria. By the time she left in 2009, the percentage of infected children had dropped to less than 1% from about 10% in 2005. "Development aid in this case is making a difference," she says. "It's saving lives."

Sadly, according to many aid professionals, when examining the aid efforts of "rich" Western nations, moral responsibility for ensuring there are more successes like this appears to be lacking. At Gleneagles, Scotland in 2005, the Group of Eight (G8) countries promised to double annual aid to Africa by 2010, roughly $30 billion extra each year. In 2010, they will have fallen about $20 billion short, Sachs says.

"The task of ending extreme poverty is a collective one—for you as well as for me. The end of poverty will require a global network of cooperation among people who have never met and who do not necessarily trust one another"

—Jeffrey Sachs, director of the Earth Institute at Columbia University and author of *The End of Poverty*

PICTURE CREDIT: AFP

This means that the G8 will not devote the same amount of money Wall Street bankers take home in bonuses at the end of a bad year to aid for 800 million of the world's poorest and hungriest people, even to honor an explicit and oft-repeated promise.

The developed world can afford to raise the poorest countries out of extreme poverty, Sachs argues, agreeing with the MDGs' calculation that 0.7% of the gross domestic product (GDP) of developed countries would be enough. (The US currently donates about 0.14% of its GDP to development assistance).

EGREGIOUS BANK BEHAVIOR

With this in mind, the behavior of Wall Street banks has been egregious to say the least. The US Federal Reserve pumped more than 1 trillion dollars of new liquidity into the banking system during the global financial crisis of 2008, despite banks' terrible balance sheets and record of reckless behavior. In 2009, as a result, Wall Street netted an estimated $55 billion or more in profit.

"With a knowing smirk, the bankers helped themselves to their share of the seignorage as well, to the tune of $20 billion in bonuses, not even counting unrealized stock options," Sachs says.

The solution to this inequity, according to Sachs and others, is to earmark part of a globally harmonized bank tax to ensure that the US and other laggard donors live up to international standards of burden-sharing. Politicians are facing up to this, with the White House and 10 Downing Street calling for a new banking tax to recoup some of the seignorage, as have other governments of the Group of Twenty countries.

CORRUPTION MYTH

An often-cited argument against richer nations simply handing over more cash to the impoverished is that it is pointless because of widespread corruption and misrule in countries receiving aid. These critics have got it wrong, according to some sources.

Researchers Henrik Hansen and Finn Tarp of the University of Copenhagen, for example, have examined the

Access to markets and the market mechanism are only likely to succeed if accompanied by carefully focused aid, global governance (of wealthy and poor nations alike), and well-managed markets

relationship between foreign aid and growth in real GDP per capita. They show that aid increases the growth rate, and that this result is not conditional on "good" policy.

Besides, in the past decade, societies in Asia perceived to have extensive corruption, like Bangladesh, Indonesia, and Pakistan, have enjoyed rapid economic growth while relatively well-governed countries in Africa, such as Ghana, Malawi, Mali, and Senegal, have failed to prosper.

The idea that if you give aid some of it is going to be misused is undeniable, but the plain truth is if you do not do it, more people will suffer or die.

ACCOUNTABILITY NEEDED

Few people would argue that money should be indiscriminately handed out with no accountability, and even the most ardent proponents of more aid admit political will and cooperative effort in recipient countries are essential.

As Sachs says: "The task of ending extreme poverty is a collective one—for you as well as for me. The end of poverty will require a global network of cooperation among people who have never met and who do not necessarily trust one another."

The solutions to extreme poverty, like the sources, are complex. However most societies with the right ingredients—good harbors, close contacts with the rich world, favorable climate, adequate energy sources, and freedom from epidemic disease—have escaped extreme poverty, he points out.

Asia's remaining challenge is not mainly to overcome indolence and corruption, but to take on the solvable problems of geographic isolation, disease, and natural hazards, and to do so with new arrangements of political responsibility that can get the job done.

Many of Sachs's arguments are more relevant than ever, especially in their focus on the MDGs, according to Arvanitakis. "We need to have a real attempt on these goals," he says.

WANTED: CAREFULLY FOCUSED AID

However, access to markets and the market mechanism are only likely to succeed if accompanied by carefully focused aid, global governance (of wealthy and poor nations alike), and well-managed markets. The global financial crisis highlighted the vagaries of the market mechanism and the need for government intervention, Arvanitakis asserts.

"The key here is the right balance between the market, governments, and civil society to look at what development really means. Yes, GDP is important, but other quality of life measures need to be given equal if not greater weighting," he says.

What encourages Arvanitakis is the number of "good" aid projects that serve as examples of what can be done. These are designed from the bottom up, controlled by the local population

GOVERNANCE: KEY TO DEVELOPMENT

By the early 1990s, Bangalore, India had experienced decades of rapid growth, and its government was unable to deliver many public services needed by citizens. Many residents had simply given up on getting the basics—water, power, and sanitation services—from the government.

Reacting to urban growth and poor public service delivery, a small group of citizens banded together in 1993 to try to address Bangalore's problems. The group began compiling "report cards" on how city agencies were performing and presented them to the government, according to the report *Pro-Poor Service Delivery Initiatives* by the community association Bangalore Mahanagara Palike.

The report cards led to substantial reforms in government services. From only a few percent of city residents saying they were pleased with local government services in 1994 to more than 70% expressing satisfaction by 2003.

The transformation in Bangalore is an example of what many divergent views in the aid debate agree is key to helping poor countries effectively use both internal and external funding to help their people: good governance. The policies, laws, and institutions must operate effectively in order for funding to reach those who need it most.

"The prevailing notion on aid effectiveness is that aid is most effective in accelerating economic growth and poverty reduction in countries with good governance and institutional quality," explains Jong Woo Kang, a senior economist at the Asian Development Bank.

ADB's long-term strategic framework *Strategy 2020* adds: "The state must establish institutions and policies that maximize opportunities for growth and poverty reduction. The economic success of many development member countries will depend on this kind of institutional progress, along with a policy and regulatory environment that fosters trade, investment, and technology development." ■

with assistance from nongovernment organizations (NGOs) and the government.

That is why governments and aid agencies should not only focus on more, but better aid and other measures such as fairer trade relations and the forgiveness of "odious" debt, he says. Among agencies that show how focused, accountable, and effective aid should be delivered, he points to Apheda (Timor-Leste), the International Women's Development Agency (Bougainville), and Oxfam (throughout Africa).

Batcha agrees that in many countries a mixed strategy may work. Moderate amounts of capital infused into government budgets, with capacity building and strong follow-up and oversight mechanisms provided by NGOs with experience in financial management and results reporting, may help build government capacity to absorb more funds successfully in the future.

The case for aid remains hopeful and strong, and there is much else that can be done under its banner. Writing in *Scientific American*, Sachs says payments to poor communities to resist deforestation could save species habitats. No-till farming and other methods can preserve soils and biodiversity. More efficient fertilizer use can reduce the transport of excessive nitrogen and phosphorus. Better irrigation and seed varieties can conserve water and reduce other ecological pressures. Sachs believes those changes will require a tremendous public–private effort that is yet to be mobilized.

Says Arvanitakis of Aid/Watch: "If you ask me can everyone have a four-wheel drive, no. But should every person have access to food? Yes. Maybe, in the end, to achieve this, we in the wealthy world should give up a little more. For the sake of sustainability and justice, this is not much to ask." ■

PICTURE CREDIT: UNPHOTO / RICK BAJORNAS

HATS OFF TO U2? Bono, international social justice activist and lead singer of the rock band U2, reportedly paid 1,000 pounds to have his favourite hat flown to a charity concert.

PART 2 THE CASE AGAINST MORE AID

GOOD INTENTIONS GONE AWRY

Rock star Bono, renowned for his public campaigning for debt relief for poor countries, was reportedly "panic-stricken" when he discovered he'd forgotten to pack his favorite hat for a charity concert in Italy.

Four daily newspapers in the United Kingdom, including the two largest-circulation papers, reported that Bono paid 1,000 pounds sterling to have his trilby flown from England. When the plane touched down in Bologna, a hired driver grabbed the hat and drove it 50 plus kilometers to the concert venue in Modena.

> ***"Aid has been, and continues to be, an unmitigated political, economic, and humanitarian disaster for most parts of the developing world"***
>
> **—Zambian economist and author Dambiso Moyo**

"Isn't this the same Bono who constantly . . . pressures us 'wealthy' American taxpayers to forgive the gazillions in debt owed us by such murderous terror-host states such as Sudan?" wrote online critic Debbie Schlussel.

It may be a frivolous anecdote, but it is a serious representation of the skepticism and cynicism with which many in the West have come to view the efforts of the "aid industry" and pop-star aid activists.

Less frivolous is the June 2010 report in *The Wall Street Journal* and elsewhere that United States investigators suspect Afghan officials stuffed suitcases full of cash siphoned from Western aid projects and flew them out of Kabul airport. The reports revealed that more than $3 billion of aid money has been legally declared to leave Afghanistan in this way over the past 3 years.

Cases such as the Afghan money grab have led many dismayed participants in the debate to conclude that aid money is not necessarily being well spent by the world's disadvantaged nations, is not helping the poor, and may in fact hurt them.

On the other side of the argument, Columbia University economist and author Jeffrey Sachs espouses that increased aid is the key to rescuing the poorest people in the developing world from poverty.

The rebuttal to Sachs is led by—among others—author and scholar William Easterly of New York

University. In his book *The White Man's Burden: Why the West's Efforts to Aid the Rest Have Done So Much Ill and So Little Good*, Easterly distinguishes two types of foreign aid donors: "planners," who believe in imposing top-down big plans on poor countries; and "searchers," who look for bottom–up solutions to specific needs. He favors the latter to work on aid solutions: people who try to understand those who may need help and to include them in the solutions.

Since the 1950s, the "Big Aid" legacy spawned a bureaucratic approach to economic development that has been the standard ever since, according to Easterly and others, albeit with some lip service to free markets by the World Bank (which has a billion-dollar administrative budget), regional development banks, national aid agencies such as the United States Agency for International Development, and the United Nations development agencies.

Sachs's underlying assumptions are from the Enlightenment, which believes in human ingenuity solving all problems and creating progress through rational processes, says Robert Reese, professor of cross-cultural ministry at Mid-Atlantic Christian University in North Carolina, who has worked in developing countries.

This mentality is "strongly rooted in the Western world and fuels the aid system now in place," says Reese. "I see it as a relic of the colonial mentality where the progressive peoples can decide for the others what's best."

This colonial viewpoint sees poverty as a problem for Western engineering to solve. It doesn't consider the real conditions on the ground, especially the mentality of the supposed beneficiaries, who are generally not students of the Enlightenment at all, Reese adds. It also overlooks local initiative, which abounds in Africa and Asia, in favor of foreign experts doing the "engineering."

In Nepal, many educated and qualified Nepalese feel that their own expertise is better than that of any expatriate, writes British aid critic Graham Hancock, author of the seminal book *Lords of Poverty.* They also point out that, at a rough estimate, aid agencies could hire 30 to 50 Nepalese experts with the money required by just one foreign adviser.

$2.3 TRILLION AND COUNTING

Of the $2.3 trillion (measured in today's dollars) spent on aid over the past 5 decades, what is there to show for it? Not much, if anything, according to many pundits. "It's fair to say this approach has not been a great success," writes Easterly.

Zambian economist and author Dambiso Moyo uses stronger language. "Aid has been, and continues to be, an unmitigated political, economic, and humanitarian disaster for most parts of the developing world," she says.

BUILDING SELF-RELIANCE A young girl uses an ECHO bucket to fetch water in Sudan. Some experts say there is a greater need for better rather than more aid. Such assistance should seek to involve the local community and build their capacity to improve quality of life.

Examples to support her contention are not hard to find in Asia. For example in *Lords of Poverty,* Hancock tells the story of a World Bank project, a $44-million tantalum processing plant on the Thai island of Phuket, that epitomizes the well-intentioned but sometimes ineffective aid projects.

Keen to disburse funds rapidly, World Bank representatives had failed to canvass local opinions of the scheme before going ahead with it. The locals knew, however, that the huge ore refinery would be noisy and messy and, thus, represent a threat to the tourist trade on which their livelihoods depended. So they burned it down.

Part of the problem, according to Sithara Batcha, a Geneva-based development agency employee who has worked in developing countries, is the inflexibility of many aid organizations. Some strongly feel the best way to get results is to directly fund government budgets. While this ensures funding ends up in-country and promotes country ownership, the risk is that funds will be misused by corrupt governments.

On the other side of the spectrum are organizations that fund (mostly Western) NGOs and corporations. They can generally be sure their funds are not lost to corruption, but "vast sums" fail to end up in the country and go instead to financing the organization itself and its workers. Critics note the huge amounts of taxpayers' money that

PICTURE CREDIT: AFP

HIDDEN COST OF FREE FOOD **Sacks of flour are offloaded from a US Army CH-47 Chinook helicopter for aid flood survivors in Kallam Valley in Pakistan in August 2010. Aid critics warn against the danger of flooding the market with free food during a crisis as it may affect the livelihood of local suppliers such as farmers.**

goes to funding bureaucrats around the globe employed by bodies such as the UN and the World Bank.

Obviously, the aid industry is governed by codes of conduct and standards that aim to ensure aid at least does no harm. But as the Phuket anecdote shows, no standards or codes can guarantee effective action on the ground, and humanitarianism remains messy and imperfect.

Aid worker Conor Foley, author of *The Thin Blue Line: How Humanitarianism Went to War*, also agrees that well-intentioned aid projects "can do great harm," citing the case of food aid sent by rich countries to poor ones during food crises. When a local market is flooded with free food, prices tend to fall, pushing poor farmers struggling to make a living out of business. Sometimes food aid arrives too late, especially when it is shipped from far away. The food crisis may have ended, but the aid ends up diminishing food security by disrupting the market for the next season's harvest.

PICTURE CREDIT: UN PHOTO / SOPHIA PARIS

"The aid industry needs to take a small-scale approach that does not overwhelm local peoples with foreign kindness, but treats them as humans with the capability of handling their own problems, even if they do need some small help to do so initially"

—Robert Reese, professor of cross-cultural ministry at Mid-Atlantic Christian University in the US

DEBT RELIEF: 'A BAD IDEA'

Solutions tacitly accepted by development professionals are targeted by Easterly, to sobering effect. In his book *The Elusive Quest for Growth*, he is particularly critical of debt relief.

Despite its overwhelming popularity among policymakers and the public, debt relief is a bad deal for the world's poor, says Easterly, because it transfers scarce resources to corrupt governments with proven track records of misusing aid.

As another example Easterly points to the Ivory Coast, an African nation that built not one but two new national capitals in the hometowns of the country's previous rulers as it was piling up debt. Then it had a military coup and a tainted election, not an environment in which aid would be well used.

Meanwhile, poor nations that did not mismanage their aid loans so badly—such as Bangladesh and India—now do not qualify for debt relief, though their governments would likely put fresh aid resources to better use.

WHO OWNS DEBT?

Crushing debts do not worsen poverty in the developing world, Easterly adds, because the foreign debt of poor countries has always been partly fictional. Whenever debt servicing became too onerous, the poor nations simply received new loans to repay old ones.

Besides, debt relief advocates should remember poor people do not owe foreign debt, their governments do. "Poor nations suffer poverty not because of high debt burdens but because spendthrift governments constantly seek to redistribute the existing economic pie to privileged political elites rather than try to make the pie grow larger through sound economic policies," writes Easterly in an article for *Foreign Policy*.

Likewise, it is the elite who tend to benefit from aid-funded projects once they are completed. In Bangladesh, the Greater Dhaka electricity transmission and distribution system cost British taxpayers 38 million pounds. But more than 85% of Bangladeshis live in rural areas and cannot benefit from the electrification of the capital city. In Dhaka, the main users of the system were not the poor but the middle classes and foreigners. "As a 'development' initiative it would appear to leave much to be desired," writes Hancock in *Lords of Poverty*.

The tragedy is that no one seems to care that money disappears, says Easterly. "That breaks my heart over and over again," he says in a recent interview with online ideas forum *Big Think*.

This may be overly harsh, because many people obviously have the best of intentions, yet it is arguably true most have no idea what happens to their well-meaning donation once they post their check.

Clearly, there are massive problems associated with the way in which international aid is delivered, and

commentators can whine about them endlessly and will probably be right.

Practical solutions to such an intractable issue are harder to distill. Many have been advocated. These seem to be among the most sensible:

1 REJECT THE BIG PLAN APPROACH

First and foremost, the big plan approach should be rejected by the UN and other aid agencies. As Easterly observes, large-scale crash programs, especially by outsiders, often produce unintended consequences. "The simple dreams at the top run afoul of insufficient knowledge of the complex realities at the bottom."

Piecemeal reform motivates specific actors to take small steps, one at a time, and then tests whether that small step has made poor people better off. It is then easier to bypass corrupt governments and local bureaucrats and support those people who have local solutions to problems.

Market mechanisms can sort through the projects that work and those that fail, says Easterly. The West achieved gradual success this way, as did the People's Republic of China and India in the 1980s and 1990s through gradual market reforms.

"The aid industry needs to take a small-scale approach that does not overwhelm local peoples with foreign kindness, but treats them as humans with the capability of handling their own problems, even if they do need some small help to do so initially," says Reese, of Mid-Atlantic Christian University.

Geneva-based aid professional Batcha agrees. Aid should be delivered in true partnership with local people, not just governments, she says, and it is essential for aid professionals of every sort to be aware of "local context." Those responsible for delivering aid should think more creatively, funding local players: entrepreneurs, businesses, NGOs,

WAITING FOR CHANGE **Beggars gather on the slopes of the Bromo volcano in Java, Indonesia during the Kosodo festival to collect the offerings of food and coins thrown by thousands of visitors into the active volcano. Opinion is still divided over the value of donations in poverty reduction. .**

and even governments, she says. This is the best way to get to know the situation on the ground and tailor development funding and solutions accordingly. (Stories abound of foreign aid executives staying in a luxury hotel in a developing nation for a week and then professing to know what locals need.)

2 ENSHRINE ACCOUNTABILITY

Second, aid bodies must become more accountable for results. *Lords of Poverty* author Hancock points to the fact that the bureaucracy of the UN and its huge budgets have continued to balloon. If the organization was being effective in alleviating poverty, it would have put itself out of business long ago. Ergo, it is not accountable for the very results it expects to achieve under its charter. "There's no accountability for… basic things, and so these basic things don't happen," says Easterly in the *Big Think* interview.

3 OPEN, HONEST DEBATE

Third, changes in the way aid is delivered should start with a more open and honest debate among aid agencies and professionals about how effective they are being, especially about the effects of aid diversion to ruling elites and corruption—sensitive subjects in an industry whose funding and jobs depend heavily on its reputation.

The media, too, has a more responsible role to play in promoting openness, according to some experts, especially in war situations. Warring parties often use journalists to draw attention to their conflict and so win more aid, says Linda Polman, author of *War Games: The Story of Aid and War in Modern Times.*

"Armies, rebels, and militias steal food supplies from warehouses or from international aid convoys and either consume them or sell them to top up their war chests," writes Polman. "Bringing food aid to a war zone can amount to a form of arms delivery."

Finally, relief agencies and development professionals should, as a prime rationale for their existence, acknowledge that aid is not necessarily benign by nature and does not automatically equate to a better world.

Ultimately, as with all complex problems, the most effective solutions may be disarmingly simple. Those responsible for delivering help to the poor should focus not on more aid, but on better aid, and should remember that a good aid project is one that is designed from the bottom up and controlled by the local population. ■

PICTURE CREDIT: HEMIS.FR


With some solutions for climate change
...you simply add water
Climate change endangers us all. A great way to fight it is harnessing renewable energy. ADB provides funding and assistance for clean- energy run-of-river hydropower plants across Asia. They range in size from 5 to 200 megawatts.
Eco-friendly, these plants keep rivers flowing. Electrify urban and rural areas. Supply power for people and industry. And switch Asia on to a low-carbon path.
ADB. Investing in climate change solutions for Asia and the Pacific.
ADB Asian Development Bank
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Cancer's Long Tail

Will cancer stall Asia's development? Health experts are warning that if a rising epidemic of cancer in Asia and the Pacific goes unchecked it will overwhelm the region's ill-prepared health systems

BY James Hutchinson

At Mazumdar Shaw Cancer Center in Bangalore, India, Dr. Moni Kuriakose tells a 34-year-old mother of three that the lesion in her cheek is late stage cancer caused by a decade of chewing tobacco and araca nut. As chief of head and neck oncology, he schedules her for a major operation, to be followed by chemotherapy and radiation treatment. Even so, she will have only a 50% chance of a cure.

"I see advanced cases like this every day. If diagnosed early, they could be treated by minor surgery at a local clinic," says Kuriakose, noting that the poor have limited or no access to multidisciplinary care. According to a study in the *Canadian Journal of Dental Hygiene,* oral cancer is one of the few cancers whose survival rate has not improved over 30 years.

Flavored concoctions, such as *gupta*, containing tobacco and araca nut have become popular with younger age groups, even though their use is banned by schools. "Our youngest patient was 19 years old," says Kuriakose, explaining that a surge in the use of chewing tobacco and araca nut in India is the main cause of 365,000 new cases of head and neck cancers annually, part of a region-wide upsurge in cancer.

World Health Organization (WHO) statistics show cancer already kills more people than AIDS, malaria, and tuberculosis combined. By 2020, Asia's cancer rate is expected to jump by nearly 60% to 7.1 million new cases a year.

Cancer expert Dr. Hai-Rim Shin at the WHO Regional Office for the Western Pacific in Manila says the looming epidemic of cancer will severely strain ill-prepared health systems in low- and middle-income countries, which cannot afford expensive cancer treatments available in developed countries such as Canada and the United States.

Part of the *GLOBOCAN* series published by the International Agency for Research on Cancer showed an estimated 12.7 million new cancer cases and 7.6 million cancer deaths occurred in 2008, with 56% of new cancer cases and 63% of the cancer deaths occurring in less developed regions of the world. The most commonly diagnosed cancers worldwide are lung, breast, and colorectal, with lung cancer being the

BURNING BOTH ENDS By 2030, tobacco will cause one-third of all male deaths between ages 35 and 69 in the People's Republic of China, striking down millions of breadwinners.

CHEWING ON HEALTH A worker packs freshly made beedis, chewing tobacco wrapped in tendu leaves, in Karimnagar, north of Hyderabad, India.

"In low- and middle-income countries, cancer overwhelmingly affects the poor. This has huge implications for human suffering, health systems, health budgets, and the drive to reduce poverty"

—World Health Organization Director-General Dr. Margaret Chan

PICTURE CREDIT: AFP

HOPING FOR A REMEDY **A cancer patient receives treatment at a hospital in Kolkata, India. Asia's health systems are ill-prepared with the growing number of cancer patients, particularly among the poor in the region who cannot afford expensive treatments.**

PICTURE CREDIT: AFP

number one killer.

"In low- and middle-income countries, cancer overwhelmingly affects the poor. This has huge implications for human suffering, health systems, health budgets, and the drive to reduce poverty," says WHO Director-General Dr. Margaret Chan.

Tobacco products are the greatest single cause of cancer in Asia, far outstripping other causes including aging populations, infectious agents, alcohol abuse, obesity and lack of exercise, unhealthy diet, poor sanitation, and pollution, almost all of which are rising in the wake of rapid economic gains in the region, says Shin.

The most effective strategy for dealing with the looming epidemic of cancer in developing Asian countries, she says, is prevention and early detection programs. These include: public education and awareness campaigns; effective government anti-tobacco initiatives; free early screening; vaccination programs (especially against the hepatitis B virus); and cleaning up and regulating cancer-causing pollutants, chemicals, and unregulated industrial waste sites.

The Union for International Cancer Control (UICC) campaign "Cancer can be prevented too" aims to raise awareness of the fact that the risk of developing cancer can potentially be reduced by up to 40% through simple lifestyle changes and other control measures, such as vaccination, regular physical activity, eating healthily, limiting alcohol consumption, reducing sun exposure, and avoiding tobacco.

TOBACCO STRAINS HEALTH CARE

A 2010 *Asian Pacific Journal of Cancer Prevention* study estimates smoking currently kills more than 5 million people per year and is the biggest cause of preventable death worldwide. As anti-smoking campaigns have reduced the number of smokers in developed countries, their ranks have ballooned in developing countries, where 8 out of 10 smokers now live. If present consumption patterns continue, WHO says the number of deaths globally will increase to 8 million by 2030 with more than 80% of the world's 1 billion smokers living in low- and middle-income countries, which are targeted by tobacco industry marketers even though more than 70% of lung, tracheal, and bronchial cancer cases are directly attributed to tobacco use.

BALLOONING RISKS **Experts say risk factors and causes of cancer, such as tobacco and alcohol consumption, obesity, an unhealthy diet, and pollution, are rising in rapidly developing Asia.**

As WHO's Tobacco Free Initiative points out, the economic costs of tobacco are enormous. Besides the billions spent on public health programs treating tobacco-related diseases, tobacco users are often less productive. Many smokers also die prematurely, stripping their families of their main income.

Tobacco use and poverty are inextricably linked, says the initiative. Numerous studies show that in many of the poorest households in developing countries, more than 10% of total household spending goes to buy tobacco, leaving less money for food, education, and health care.

Cancer already kills more people in developing countries than AIDS, malaria, and tuberculosis combined. By 2020, Asia's cancer rate is expected to jump by nearly 60% to 7.1 million new cases a year

The death and disease caused by smoking are not restricted to smokers. The first study to look at the global burden of secondhand smoke was published in *The Lancet* in 2010 and estimated that a staggering 603,000 deaths were attributable to secondhand smoke in 2004. Of the deceased, 47% were women, 28% children, and 26% men. The study concludes that significant health gains can be made by reducing passive smoking worldwide, to say nothing of the burden that would be lifted from already overextended health care systems.

The nation most at peril from the scourge of tobacco is the People's Republic of China (PRC), the world's largest tobacco producer and consumer. The PRC has more than 300 million smokers, and without a major reduction in consumption, by 2030, tobacco will cause one-third of all male deaths between ages 35 and 69, striking down millions of breadwinners.

Medical costs alone from smoking already impoverish more than 50 million people in the PRC, according to WHO statistics.

Supporting the WHO Framework Convention on Tobacco Control, the *WHO Report on the Global Tobacco Epidemic, 2008* is a road map for the 150 signatories to the convention. The report lists the six most effective tobacco control policies: raising taxes and prices; banning advertising, promotion, and sponsorship; protecting people from secondhand smoke; warning everyone about the dangers of tobacco; offering help to people who want to quit; and carefully monitoring the epidemic and prevention policies.

Cities such as Shanghai are beginning to work toward curbing the harm from smoking with indoor smoke-control legislation, passed in March 2010. At the recent World Expo held in the city, smoking was banned

PICTURE CREDIT: AFP

in all restaurants. Tobacco sales and advertising were also banned.

CANCER-CAUSING INFECTIONS

"Of the 12 million people who are diagnosed with cancer each year, around 20% of cases can be attributed to viral and bacterial infections that either directly cause or increase the risk of cancer," says David Hill, who was then UICC president, ahead of World Cancer Day on 4 February 2010. "For this reason, the UICC, with over 300 member organizations in more than 100 countries, will focus this year's World Cancer Day campaign on increasing awareness of the contribution of infections to the global cancer burden."

According to WHO, examples are the human papillomavirus (HPV) that causes cervical cancer and the hepatitis B virus that causes liver cancer. Helicobacter pylori, a bacterial infection, is a major factor in stomach cancer.

Such infectious diseases are widespread in Asia, along with hepatitis C. HPV infections are usually transmitted sexually, and vaccination against HPV is an effective method to prevent cervical cancer, says WHO's Shin. Low-cost screening in conjunction with mass vaccination programs in developing countries could dramatically reduce the future incidence of cervical cancer and save millions of dollars in health care costs.

Hepatitis B virus is a serious public health problem worldwide and a major cause of chronic hepatitis, cirrhosis, and hepatocellular carcinoma (liver cancer). More than 350 million people worldwide are chronic carriers of hepatitis B virus with about 75% in Asia and the Western Pacific. Comprehensive vaccination programs being carried out in the region are protecting youngsters and also saving future health care resources.

No vaccine is available for hepatitis C, but intensified public health education about risk factors, such as intravenous drug use and unsafe blood transfusions, could help reduce transmission.

OBESITY RAISES RISK

Most people are aware that being overweight puts them at risk of heart disease, but few realize that obesity also increases the risk of many common cancers. By analyzing 282,137 cases of cancer, a study by the Department of Surgery, School of Cancer Studies, University of Manchester, found increased weight heightened the risk of various cancers, including esophageal, thyroid, colon, and renal cancers. The study also found an increase in body mass index in women raised their risk of endometrial and gallbladder cancers while increased weight in pre- and post-menopausal women in Asia and the Pacific raised their risk of breast cancer.

A study on the cost-effectiveness of breast cancer interventions partly funded by WHO noted that breast cancer as a public health problem is growing throughout the world, but especially in developing regions, where the incidence is rising by as much as 5% per year and mortality is also greater. The study reported that only half of diagnosed breast cancer cases in the world come from developing countries, meanwhile 75% of deaths from the disease occur in the developing world. Another study in the Jiangsu Province of the PRC showed that breast cancer risk is associated with body size, and that moderate occupational and recreational physical activity has protective effects.

WHO advises: "Recognizing possible warning signs of cancer and taking prompt action leads to early diagnosis. Increased awareness of possible warning signs of cancer, among physicians, nurses, and other health care providers as well as among the general public, can have a great impact on the disease. Some early signs of cancer include lumps, sores that fail to heal, abnormal bleeding, persistent indigestion, and chronic hoarseness. Early diagnosis is particularly relevant for cancers of the breast, cervix, mouth, larynx, colon and rectum, and skin."

WHO estimates that excessive alcohol intake causes about 20%–30% of esophageal and liver cancers worldwide, with most of the global increase in alcohol consumption in recent decades occurring in developing countries. Two standard drinks for men and one for women per day is considered a safe level.

According to the UICC, if the growing worldwide burden of cancer goes unchallenged, new cases will more than double to 26 million and result in 17 million deaths by 2030.

Says Dr. Eduardo Cazap, current president of the UICC on World Cancer Day, 4 February 2011, "With individuals, governments, and policy makers of the world working together, we have the ability to ease the global burden of cancer now and for future generations." ■

AN OUNCE OF PREVENTION **Studies show that some infectious diseases such as Hepatitis cause or riase the risk of cancer. Mass vaccination is among the health programs that are expected to protect future generations from cancer.**

PICTURE CREDIT: AFP

Solving Problems

Two physicists took on the challenges of a small, impoverished high school in the central Philippines and ended up addressing the educational issues of a nation

BY Floyd Whaley

When Christopher and Maria Victoria Bernido started to run a small school in an impoverished town in the central Philippines, they were shocked by the size of the task.

"The school was ready for foreclosure," says Mr. Bernido. "There were ceiling leaks in several classrooms and offices. When it rained outside, it rained inside." In addition to dilapidated facilities, the teachers were poorly paid, the curriculum was outdated, and student and faculty morale was low. Rehabilitating the school would require lots of work and money.

Despite the problems, the two long-time educators decided to take on the challenge of transforming a poorly funded school in a small town into a progressive learning center.

"When we took over the school, we said to ourselves, 'Before we criticize the government for not solving the problems of education in the country, let's just try to solve the problems of this small school,'" says Mrs. Bernido. "We soon realized that the problems of this small school were also the problems of education in the Philippines in general. These same problems were being replicated in schools nationwide."

The Bernidos were no strangers to education. After graduating from the University of the Philippines, they both earned doctorate degrees in physics from the same college, the University at Albany, State University of New York. Later, they headed the National Institute of Physics at the University of the Philippines in the 1980s and received awards for their teaching and research.

As nationally recognized scientists, they found that the field they loved—science—was neglected in Philippine education. Basic science courses were often lacking at the lower grade levels and for quality advanced scientific study, students had to come to a few institutions in Manila.

> ***"Basic science is the foundation of building a strong country. Countries that are strong in science are strong in development"***
>
> **—Christopher Bernido**

"Basic science is the foundation of building a strong country," says Mr. Bernido. "Countries that are strong in science are strong in development. You need scientific manpower to be competitive, and the lack of it in the Philippines is glaring."

The Bernidos responded to this problem in 1992 by opening a science research center in Mr. Bernido's hometown of Jagna, Bohol, in the central Philippines. It was there that they became interested in the Central Visayan Institute Foundation (CVIF), a struggling private high school operated by his then 77-year-old mother.

After taking over the school in 1999, they saw little improvement for the first few years. The obvious solution was for the school to obtain an infusion of funding in order to upgrade the facilities, modernize the curriculum, and increase the pay of the teachers. But they rejected the notion of looking for a straight financial fix.

"Rather than go for grants, which wouldn't be sustainable, we said, 'let's try to improve the system. Let's make ourselves more efficient before we ask for funding from others,' " Mrs. Bernido relates.

Tackling the problem like a complicated equation, they devised a system where a single instructor could teach three classes simultaneously. Students devote 80% of class time to independent study while lecturing by the teacher is limited to 20%. This way, one teacher can move from class to class, providing the lecture portion while a teacher who is not an expert in the subject simply maintains order. By stressing independent study, particularly at the start of the class, the students are eager to hear from the teacher when the lecture begins.

"By the time the lecture comes, the students are hungry for answers," says Mrs. Bernido. "You don't need a song-and-dance motivational strategy to get them to listen."

SUCCESSFUL FORMULA **Philippine President Benigno Aquino (left) congratulates physicists Christopher and Maria Victoria Bernido as they receive the Ramon Magsaysay Award for pioneering an effective, low-cost learning program that aims to raise the quality of education in the country.**

CRAMMING, LITERALLY **Grade 2 students are packed in a small classroom that used to be a bathroom at a public school in Manila.**

Under this system, fewer teachers are required so the pay can be increased. Their system, called the CVIF Dynamic Learning Program, involved several other innovations as well, including carefully designed learning programs and detailed student performance tracking tools.

"We didn't think of it as an innovative education system," says Mrs. Bernido. "We were just solving problems."

The system improved their school. They were able to provide a higher level of education at lower cost. It also caught the attention of educators around the Philippines. Since 2005, educators from more than 300 schools have visited the Central Visayan Institute Foundation. Aspects of their program are being adopted in schools around the country, and in June, all public high schools in the province where they are located will be adopting the program.

In 2010, the Bernidos received the prestigious Asia-wide Ramon Magsaysay Award for "their purposeful commitment to both science and nation, ensuring innovative, low-cost, and effective basic education even under Philippine conditions of great scarcity and daunting poverty." ■

PICTURE CREDIT: AFP

Trillions of Frenemies

Nanotechnology could revolutionize the fight against poverty… or just leave the developing world behind

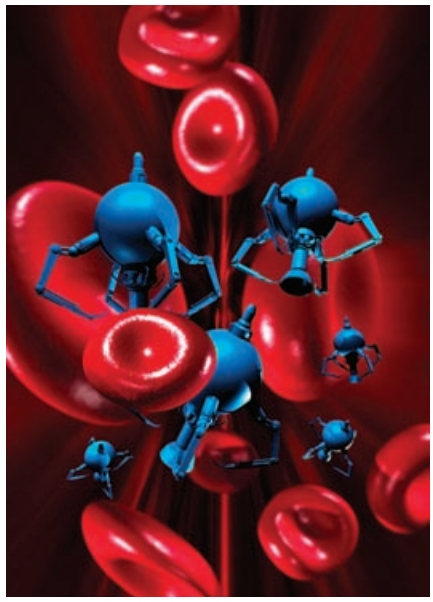
BY Floyd Whaley

Imagine a future in which the most elaborate international development tasks are done by trillions of microscopic machines that handle jobs exponentially more difficult than what can be done today, and do them faster, safer, cheaper, and better than anything now known. In this vision of the future, solar panels are sprayed onto roofs like spray paint and recycling is taken to the extreme: nearly any type of waste can be recycled into nearly anything else.

Though it sounds like science fiction, this is what many see as the potential of the emerging field of nanotechnology. It is likened by some to a transformation the world has not seen since the Industrial Revolution or the advent of the Internet. While corporations and governments grapple with this relatively new field of science, development professionals are just beginning to recognize its significance and potential dangers.

"Advances in nanoscale sciences may present a new opportunity to … improve the livelihood of the poor," notes a February 2011 report by the International Food Policy Research Institute, titled *Agricultural, Food, and Water Nanotechnologies for the Poor.*

"Because nanoscale science and engineering are still at their early stages, it is difficult to gauge the future importance of nanotech applications," the report continues. "But most observers in the nanotechnology field believe that they are bound to have a gigantic effect, altering technologies used in all types of industries, provided their risks can be managed."



NANOROBOTS Tiny diseases-fighting robots in the human body are envisioned by proponents of nanotechnology.

Those risks worry some. They see this new technology as so powerful that it tinkers with the fundamental building blocks of the universe.

THE BUILDING BLOCKS OF MATTER

The definition of nanotechnology varies depending on the source consulted. In general it is an applied science that involves the control of matter, and fabrication of devices or materials, on the atomic and molecular scale, generally 100 nanometers (one billionth of a meter) or smaller.

Controlling the way the basic building blocks of matter are snapped together could create products that are cleaner, stronger, lighter, and more precise.

"The idea that virtually any type of extraordinary item can be made by manipulating matter at the molecular level has the entire world fascinated," notes the Asian Development Bank (ADB) publication *Asian Environment Outlook* in its 2005 edition.

Much of the initial work in this field was focused on building extremely tiny machines that could undertake tasks at a scale that is impossible today. "An individual machine could be designed to manufacture superior materials, convert solar energy to electricity, or even, ultimately, enter the body to fight disease and aging at the cellular and molecular level," notes a white paper from Zyvex Labs, a United States company that makes nano-probes that examine computer chips.

In recent years, the field has broadened to include a variety of novel uses of material built at the nanoscale. A fundamental idea behind this research is that everything in the universe is built from the same basic material. If this material can be manipulated, basic problems can be solved: any type of waste material theoretically could be broken down into its most basic form and rebuilt into any productive material; building materials could be rebuilt at the molecular level to be much stronger and lighter than they are now. Some see the possibilities as endless.

NANOTECH FOR DEVELOPMENT

The commercial market for nanotechnology-related products is

PICTURE CREDIT: SCIENCE PHOTO LIBRARY

LAB ON A CHIP **Launched by a Japanese company, a blood test chip using nanotechnology analyzes illness-related proteins in a drop of blood.**

PICTURE CREDIT: HEMIS.FR

expected to reach $1 trillion by 2015, according to the ADB report. But the use of the technology in development work is in its infancy, notes Todd Barker, a partner with the Meridian Institute, a US-based organization that tracks nanotechnology.

"There has been much talk, and certainly a significant amount of research and development work, regarding the potential of this emerging technology to help developing nations with energy use, medicine, clean water, and other needs, but actual, ready-to-deploy products are minimal," says Barker.

Monique Gilbert, who edits the publication *Nanotechnology and Development News,* points to water sanitation as one of the most promising nanotechnology-related areas in development work, in part because it is more advanced and likely to be commercially available before other innovations.

Tata, one of India's largest conglomerates, has launched a "water purifier priced for the masses." The Tata Swach does not require running water, electricity, or boiling, and is priced such that rural Indian consumers can afford it, notes Gilbert. The filters have a lifespan of 3,000 liters—about enough to provide a family of five with drinking water for a year.

Another promising use of nanotechnology in water purification is being developed by scientists at Stellenbosch University in South Africa, says Gilbert. Researchers there have developed a high-tech "tea bag" filter which fits into the neck of a bottle and makes polluted water potable as you drink it.

"The filter promises to provide easy access to clean drinking water for vulnerable communities, such as those living near polluted streams," says Gilbert.

Outside the area of water sanitation, an engineer at the University of California, Los Angeles, has created the world's smallest and lightest microscope, which could be used for medical tasks in poor countries, including disease monitoring in rural areas and testing water quality after natural disasters.

"The microscope, which weighs only 46 grams, obviates the need for trained technicians to analyze the images produced," says Gilbert. "Instead, the images are analyzed instantaneously by a computer."

Another potential use of nanotechnology in the field of health is being developed by a researcher at the Council for Scientific and Industrial Research in Cape Town, South Africa. The product is designed to ensure tuberculosis patients take their medicine, which is required every day for 6 to 9 months.

The product uses "nanoparticles that stick directly to infected cells and release the drug slowly so patients do not need to remember to take their drugs," explains Gilbert.

A similar innovation—being developed by the Germany-based Helmholtz Centre for Infection Research, and supported by the Bill & Melinda Gates Foundation—uses nanoparticles triggered by perspiration to deliver vaccines via pores in the skin.

"This method of vaccination bypasses the traditional and more painful needle-based vaccines," says Carlos Alberto Guzmán, a scientist with the center.

"GREY GOO"

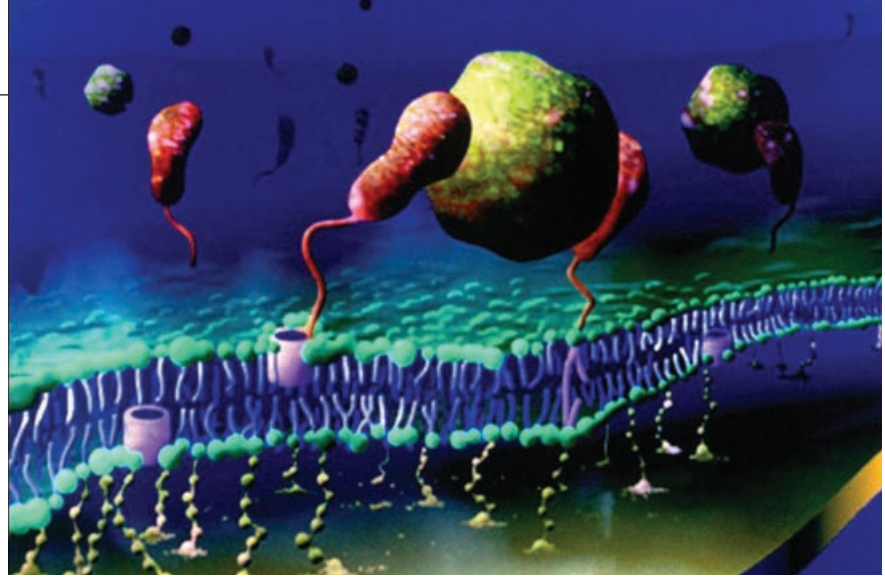
The enthusiasm of nanotechnology supporters is matched by the alarm expressed by its detractors. Many groups see it as dangerous technology with unknown consequences. Some envision a world of nanotechnology run amok.

"Media coverage of nanotechnologies has invariably raised the specter of the 'grey goo': a doomsday scenario in which nanoscale robots self-replicate out of control, producing unlimited copies of themselves, consuming all available material and ultimately laying waste to the planet," notes the report *Nanoscience and Nanotechnologies: Opportunities and Uncertainties,* produced by the United Kingdom's Royal Society and Royal Academy of Engineering.

While the Royal Society generally dismisses this concern as science fiction, there are serious issues related to the development of nanotechnology.

"Materials engineered at the nanoscale can exhibit fundamentally different properties, including toxicity, with unknown effects," says Chee Yoke Ling of Third World Network, a nonprofit organization based in Malaysia. "Current research raises red flags that demand precautionary action and further study."

"As there are now hundreds of products containing nanomaterials in commerce; the public, workers, and the environment are being exposed to these unlabeled, and in most cases, untested materials."



NANOPARTICLES An artist's conception of nanoparticles delivering drugs to the bloodstream.

Opposition to the use of nanotechnology in development projects, and in developing countries, involves specific issues that differ in some regards from the concerns expressed regarding the commercial development of the technology, says Gilbert, with *Nanotechnology and Development News*.

"This emerging technology could affect developing nations adversely in unexpected ways," she says. "Nanotechnology could reduce the need for raw materials—a development that some would applaud—but since many developing nations are exporters of such materials, they could suffer detrimental social and economic impacts."

Gilbert points out that government regulations regarding nanotechnology are still nascent in many developed countries, including leaders in the field, such as the US and European nations. Regulation in developing countries is likely to be even less or nonexistent.

"The overall concern that nanotechnology is being used in commercial products before there is a complete understanding of the implications of this emerging technology certainly applies to development work as well," she notes.

EXPENSIVE TECHNOLOGY FOR THE POOR

In addition to vocal opposition to nanotechnology by many groups, there are other significant challenges to its development. One of the key issues is that nanotechnology development is extremely expensive.

Most of the nanotechnology-enabled products being developed for development/poverty reduction projects come via universities or foundations, such as the Bill & Melinda Gates Foundation, says Meridian Institute's Todd Barker.

"Industry is much more focused on commercial products that will be profitable," explains Barker. "The reality is that the products needed in developing nations have high research and development costs and low profitability, which is not of great interest to companies."

The International Food Policy Research Institute report notes that "agricultural and food nanotechnologies, and especially those that could lead to reduced poverty or food insecurity, are bound to face many challenges before being commercialized and used by rural poor."

"As with other new technologies, all steps in the process may need to overcome constraints—from investment and research and development to regulatory approval, commercial release, distribution, access, availability, adoption, and proper use by users," the report states.

The report notes that much of the responsibility for bringing the benefits of this new technology to the poor lies with the public sector: "Whether nanotechnologies succeed in helping the poor will largely depend on whether public research institutions, technology developers, national governments, and international donors are able to address these multiple challenges in the coming years." ■

PLENTY OF ROOM AT THE BOTTOM

By most accounts, nanotechnology was born on 29 December 1959 at the annual meeting of the American Physical Society of the California Institute of Technology. That day after dinner, Nobel Prize-winning physicist Richard Feynman gave a lecture titled "There's Plenty of Room at the Bottom."

"What I want to talk about is the problem of manipulating and controlling things on a small scale," Feynman said that night. "The principles of physics, as far as I can see, do not speak against the possibility of maneuvering things atom by atom."

The US-based technology company, Zyvex Labs, in its study *Molecular Nanotechnology: A Realistic Treatment*, notes that after steady growth in interest in the technology, a landmark US Congressional hearing in 1999 brought the issues to center stage.

Ralph Merkle, vice-president of technology assessment at the Foresight Institute, a US organization devoted to the study of nanotechnology, told the US Congress: "Nanotechnology will replace our entire manufacturing base with a new, radically more precise, radically less expensive, and radically more flexible way of making products."

At the same hearing, Nobel Laureate Richard Smalley told Congress: "The impact of nanotechnology on health, wealth, and lives of people will be at least the equivalent of the combined influences of microelectronics, medical imaging, computer-aided engineering, and man-made polymers developed in this century." ■

PICTURE CREDIT: AFP

"If you educate a boy, you educate one boy, whereas if you educate a girl, you educate her entire family and community."

Prime Minister Sheikh Hasina of Bangladesh

"Today, 1.2 billion adolescents stand at the challenging crossroads between childhood and the adult world. Nine out of 10 of these young people live in the developing world and face especially profound challenges, from obtaining an education to simply staying alive—challenges that are even more magnified for girls and young women."

United Nations Children's Fund (UNICEF) Executive Director Anthony Lake writes in *The State of the World's Children 2011*

"Gender equality is not just a lofty ideal, it is also crucial for agricultural development and food security."

Jacques Diouf, director-general of the Food and Agriculture Organization of the United Nations, on the eve of the 100th anniversary of International Women's Day on 8 March 2011

"I strongly believe that in the 21st century, partnership networks will play a more important role than alliance systems. . . . You can only have alliance to withstand enemies, but you can have partnerships for everything."

President H. Susilo Bambang Yudhoyono of Indonesia, speaking at the World Economic Forum in Davos, Switzerland in January 2011

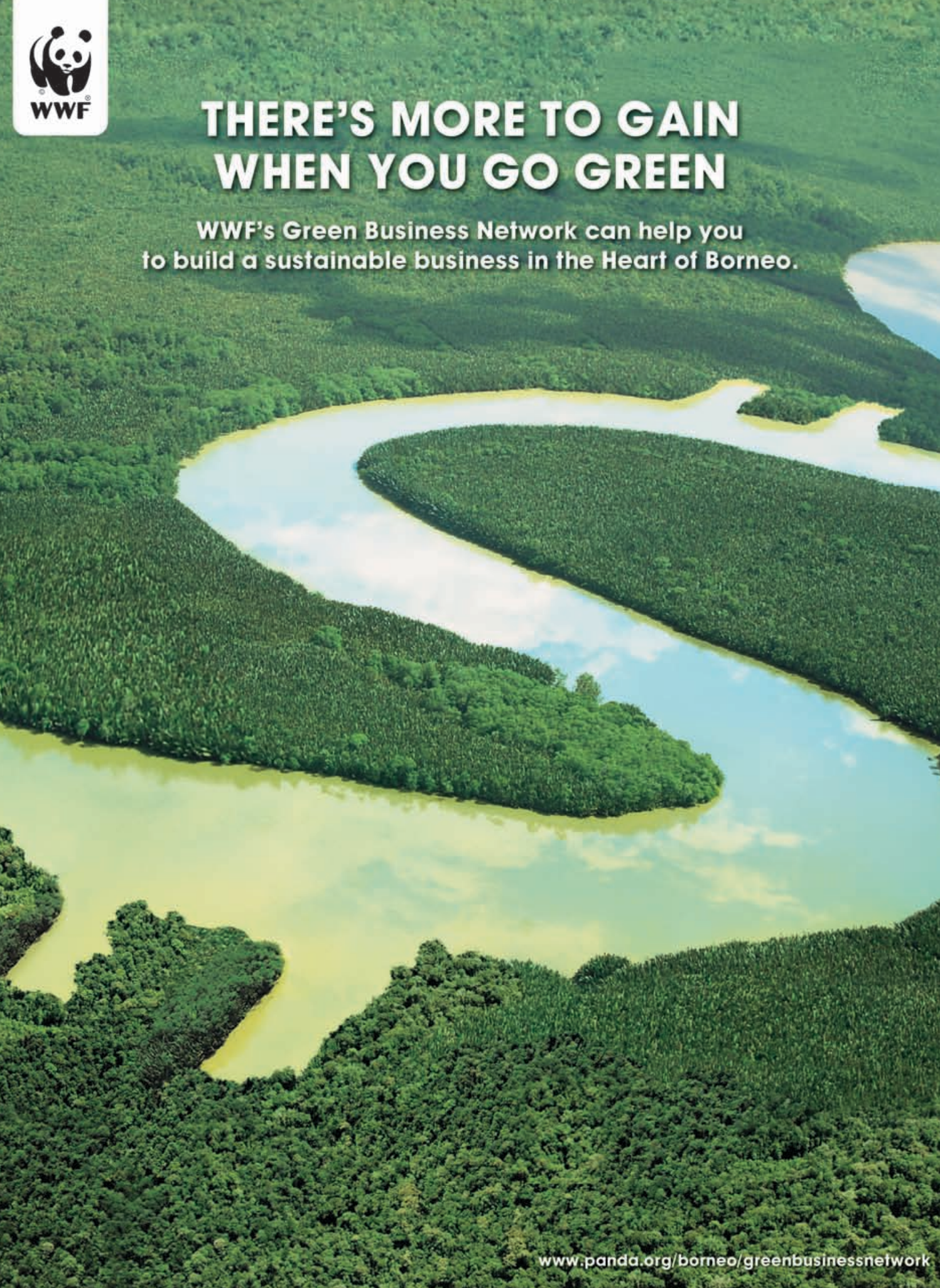
"I am absolutely passionate about education because I believe it gives everybody the opportunity to shape their own lives for the future. And wherever I encounter women and girls, I know what can change their lives is the ability to have a great quality education."

Australia's first female prime minister Julia Gillard at the 2011 International Women of Courage Awards Ceremony in Washington, DC

"In the 21st century, it's not enough to leave no child behind. We need to help every child get ahead."

United States President Barack Obama, asking the US Congress in March to fix the No Child Left Behind law

PICTURE CREDIT: UNICEF/EXECUTIVE DIRECTOR ANTHONY LAKE), OFFICIAL PORTRAIT OF US PRESIDENT OBAMA, AFP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