

The Future Can't Wait

Over-the-Horizon Views on Development

This book is the rare and welcome exception, a genuine breath of fresh air.

— Anne-Marie Slaughter
Former Director of Policy Planning,
United States Department of State

Edited by Steven Gale and Sarah Jackson



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Video clips of the symposium and interviews with speakers and participants can be found at: <http://kdid.org/events/symposium-future-development-challenges>

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Part I

Introduction

Foreword

On November 4, 2011, the U.S. Agency for International Development (USAID) hosted the first-ever “Symposium on the Future of Development Challenges” in Washington, D.C. Along with our partners at the Department of State, the Woodrow Wilson International Center for Scholars, and the National Defense University, we brought together development theorists and practitioners, economists and demographers, scientists and futurists to explore and discuss emerging development trends that will shape our collective policies and programs long into the future.

It was an inspiring day. The symposium’s goal was to use futures analysis to help USAID and other development organizations turn our vision from our current portfolio of projects and programs, and extend our gaze out over decades to come. In so doing, we were seeking to catch up with our counterparts in the private sector, the intelligence community, and the military, who have been engaging in futures analysis for years. A brief view of development trends over the past two decades suggests how important this exercise can be.

Today, the technology available to every person on the planet in a personal digital assistant is more advanced than super-computers in 1990. Breakthroughs in science and innovation applicable to global health, food security, and climate change adaptation and remediation occur daily. The flow of capital to developing countries — about \$1 trillion each year — now dwarfs development assistance, making public-private partnerships ever more important. Child mortality rates are plummeting throughout the developing world at rates even the most optimistic experts could not have anticipated, producing a so-called “demographic dividend.” The wave of democratic governance has accelerated: when the Berlin Wall fell, only two of our development partners in Africa were democracies; today, more than 20 enjoy that status.

Many of these past trends will continue into the future, but as we know from investment prospectuses, past performance is not necessarily an indicator of future developments. The many outstanding presenters and discussants at the November 2011 symposium stretched our imaginations and forced us to reassess our developmental, demographic and foreign affairs assumptions.

As I launched the symposium, I could not help but think back to the work of Isaac Asimov, the American biochemistry professor and renowned science fiction author. In 1951, Asimov published the novel *Foundation*, the first of seven volumes released as part of his *Foundation Series*. In these books, Asimov introduced the concepts of “mathematical sociology” and “psycho-history.” He suggested that studying the collective actions and tendencies of societies —

filtered through probability theory — can help predict the future. In his series, a group of the world's greatest scientists and thinkers came together to form the *Foundation*, an institution that seeks not just to foresee the future, but to gently guide it into more prosperous, peaceful, and democratic directions.

At the USAID symposium, attendees explored new development frontiers using futures analysis and turned the event into a virtual reality of Asimov's *Foundation*. True, our time-frame was a bit shorter than that of the *Foundation*, which looked 30 millennia in advance, but the lesson is the same. Traditional short-term development plans are no longer sufficient, and longer-term plans must be grounded in thoughtful analyses of future trends. This message is particularly important as we consider new development goals for the next generation in the follow-up on the Millennium Development Goals.

I am immensely proud of USAID's status as a pre-eminent learning institution and a thought leader in futures analysis for development. Working with our development partners in governments, multilateral institutions, the private sector and civil society, USAID seeks to elevate the importance and draw from the lessons of futures analysis. I hope you will find inspiration in the thought-provoking chapters in this book to work with us to make Asimov's vision of a *Foundation* not just a fantasy, but a reality.

Donald Steinberg *Former USAID Deputy Administrator*

About the USAID Symposium and Book Roadmap

The first-ever *USAID Symposium on Future Development Challenges* was held Nov. 4, 2011 in Washington, D.C. and brought together experts from a number of different disciplines to focus on an integrative, multidisciplinary approach to futures analysis. The symposium was divided into three sessions: Evolutions, Revolutions, and Vision 2025. These three sessions were distinguished by their outlook. Evolutions focused on gradual “evolutionary” changes consistent with traditional trends and futures analysis. Revolutions looked at unexpected “revolutionary” events and the shocks to the system that produce game-changing effects, often jump-started by new technological advances. The third session, Vision 2025, built on the first two sessions and explored a combined “vision” of what development will look like in 2025 and beyond. Each of these three sessions prompted heated discussions about the future of development agencies such as USAID and sparked debate about the steps development practitioners will need to take in order to adapt their perspectives and adjust their policies and programs to meet a changing and evolving world. The symposium was not about predicting the future, but rather about looking systematically at alternative future scenarios to facilitate better planning and project implementation for global development.

Within each of these three sessions, four cross-cutting tracks were used to help organize and focus the day’s discussions. These tracks were: populations, science and technology, politics and economies, and environment. Populations examined the changing demographics of developing countries and the implications of this change. Science and technology focused on the rapidly

changing technological advances in society and their impact on development. Politics and economies addressed issues such as regional integration, the shifting donor landscape, and a changing global economy. The environment track addressed issues such as climate change, resource scarcity, and rising energy needs.

The symposium's "3x4" format encouraged discussion on present trends, near-future possibilities, and far reaching future scenarios.

In the following chapter, *Going Long and Short Too*, Steven Gale, the symposium organizer and co-editor, makes a compelling case for why futures analysis must become an integral part of how USAID operates and should inform everything — from project design to program planning to policy formulation and decision-making. Futures analysis, a term used throughout this book, is the systematic assessment of upcoming events, trends, and data projections that enable an institution like USAID to have more impactful and resilient development programs. Futures analysis is only worth doing if policymakers are willing to take action. Futures analysis combined with actionable next steps, Gale argues, can enable Agency leadership to uncover emerging trends, envision alternative scenarios, and achieve better development results.

Part 2 of this book is comprised of six chapters authored by six different subject matter experts from the symposium. Each was a keynote speaker on a panel or a lead discussant. We asked the authors to use the symposium discussions as a starting point for their chapters, but gave them the flexibility to either expand upon or build out the ideas that were raised during the event.

The six chapters are divided into four sections that model the four tracks of the symposium described above. Each section is prefaced by a synopsis that highlights main ideas and key themes that arose during the symposium panels. These synopses were gleaned from the notes and audio recordings of the symposium and thus do not include citations.

Chapters begin with highlights of the issues that arose during the symposium, but they each go on to cover new ground and new developments that have taken place since the event. Richard Cincotta covers the populations track; Lin Wells and Andrew Reynolds address the science and technology track; Dan Runde and Leonardo Martinez-Diaz tackle the politics and economies track; and Geoff Dabelko explores environmental issues.

Richard Cincotta discusses how population age-structure and demographic projections can be used to examine future scenarios as well as how these predictions can and ought to shape U.S. policy. In particular, he explores how four different types of country age-structure categories (youthful, intermediate, mature, and post-mature) impact development initiatives, arguing that some of these categories appear to be more "favorable" for managing a modern state than others. He also highlights some of the shortcomings of interpreting age-related data in isolation and notes the importance of other factors at play such as

ethno-religious demographic shifts.

Lin Wells and Andrew Reynolds provide important insights into how the advancement of science and technology (S&T) has already changed, and will continue to change the future of development. Wells' chapter emphasizes that advancements in S&T are spurring unprecedented innovation and that investments in technological development are in the best interest of the American people and the global community. He discusses a select number of specific technological advancements that are likely to shape the near future, emphasizing that the use of technology is more important than its existence, and notes that an understanding of the value of S&T must be leveraged to improve policymaking and governance.

Reynolds' chapter discusses S&T from a less technical, but more development-oriented viewpoint. He focuses on exploring how the development assistance landscape must change as the S&T revolution — particularly in regards to information communications technology (ICT) — increases global connectivity. The chapter closely profiles the key ideas that emerged at the symposium and emphasizes how traditional assistance organizations must adapt to the new collaborative environment and leverage the powerful 21st century “aidscape” partnerships that universities and the millennials are trailblazing. Wells' chapter, like Reynolds', also emphasizes the importance of ICT. But he goes on to categorize the larger technological transformations taking place globally in terms of what he refers to as BRINE: Biotechnology, Robotics, Information, Nanotechnology, and Energy. Wells is quick to point out that building social networks and enhancing trust with local populations is just as important as any technological breakthrough to achieve development success.

Daniel Runde and Leonardo Martinez-Diaz both deliver two great chapters concerning how the world's shifting political and economic landscape will impact future development. Both chapters focus on the new role the United States must assume in the coming years, but the themes discussed are certainly applicable to other governments and government agencies throughout the world. Runde's chapter articulates how USAID must change the way it provides assistance, particularly to middle-income countries. In light of budget cuts and the rise of Brazil, Russia, India, and China, otherwise known as the BRICs, USAID and other development agencies must find a way to transform the traditional donor-recipient relationship into more of a partnership model. Runde emphasizes the potential role of increased trade, legacy mechanisms, scenario planning, triangular cooperation, and new collaboration as these partner relationships begin to take shape. Martinez-Diaz's chapter is unique in that it offers a regional lens to the topic of futures analysis. He highlights the importance of regional cooperation between Latin America and the Caribbean (LAC) and the United States, suggesting that close economic links are critical for U.S. growth and job creation as well as for LAC's economic potential.

Advocating deeper economic engagement, Martinez-Diaz describes a number of factors that make the LAC region a good future economic partner for the United States and briefly touches on the steps that the U.S. Treasury is taking to make better cooperation a reality.

Geoff Dabelko tackles environmental issues and cuts right to the core of today's shortcomings in development thinking and approaches. Unrealistic expectations and analytic inadequacies hinder development efforts around the globe. Dabelko focuses on the need to use integrated analysis, not single-sector approaches, in order to understand and solve today's complex and intertwining development challenges. He identifies "four tyrannies" that impede more effective development outcomes, not just in the environmental space. The "tyranny of the inbox" overwhelms aid practitioners by demanding their immediate attention and hinders in-depth analysis. The "tyranny of immediate results" demands outcomes before meaningful results can be achieved. Dabelko's "tyranny of the single sector" highlights the need for complex, integrative analysis. As a follow-up, Dabelko points to the "tyranny of the uni-dimensional measurement of success" which can cause program implementers to inadequately measure impact. The good news, according to Dabelko, is that these tyrannies are losing ground. In the chapter, he points out some success stories in Asia and Africa that speak to this growing shift.

In Part 3, Leon Fuerth and Steven Radelet contribute vital, forward-thinking insight in the concluding section of the book. Fuerth defines and discusses the significance of foresight research for development. For policymakers, he argues, linear models of causal relationships are no longer sufficient. Today's challenges require USAID and other government entities to be prepared to deal with policies and consequences that are interactive and concurrent. In other words, forward-thinking complex analysis is vital to the success of future development initiatives. The second half of Fuerth's chapter judiciously and articulately outlines the basic lexicon related to futures analysis so that readers are clear about concepts that are often confused and confusing.

Steven Radelet's concluding piece highlights the momentous progress global development has made over the past 20 years. He outlines six key dimensions of change that have and will continue to impact the future of development. He then details three forward-thinking scenarios that describe what the world might look like in the near future. These three scenarios: the continuation of rapid global development, the derailment of development by conflict, and increasing pressure on the planet, are compelling and plausible. Radelet closes by describing several factors that will come into play as policymakers attempt to steer the world towards the least destructive of these scenarios and towards a better future for all.

Overall, this book aims to stimulate further learning and discussion about the future of development. Futures analysis has the potential to greatly facilitate

international development; academics and practitioners alike must grasp this opportunity to improve the planning, implementation, impact, and assessment of development interventions. USAID and other development actors must start planning ahead to identify emerging trends — further ahead than ever before. The goals and aims of the development community are much more likely to be achieved if strategies, programs, and policies take these future trends into consideration. We must begin to think and plan about alternative futures now so that greater, more sustainable, and more resilient development impacts are witnessed in the future.

Sarah Jackson *U.S. Agency for International Development (USAID)*

Going Long and Short Too

Steven Gale, Symposium on Future Development Challenges organizer and book co-editor, makes a compelling case for why futures analysis must become essential to how USAID operates. By constantly monitoring emerging trends and re-calibrating programming, the Agency can stay ahead of the development curve.

Going Long

Less than 10 years ago, most energy specialists, along with the nation's top economists, saw the future of U.S. energy consumption as being almost entirely dependent on importing hydrocarbons from the usual places around the globe — not at home or from our neighbors. Another long-held view was that the United States would experience only a modest increase in domestic oil and gas production over the next decade. Consequently, domestic and global energy companies were building on-shore storage facilities for liquefied natural gas (LNG), constructing off-loading littoral LNG platforms, signing multi-year shipping contracts to transport fuels to U.S. and close-by ports, and a ratcheting back in hydro carbon-related industries and the manufacturing of energy-related equipment for domestic use. The future, 10 years out, looked clear.

As we now know, the future energy picture looks sharply different today. There is an alternative world view in the making on energy production. Hydraulic fracking and other drilling innovations are likely to make the United States a net exporter of liquefied natural gas over the next five to seven years or possibly sooner, and domestic oil production data reveals a 25 percent spike since 1980.¹ In North Dakota, legendary for its expansive farmlands and rich

1 Daniel Yergin, "The Real Stimulus: Low-Cost Natural Gas," *The Wall Street Journal*, October 23, 2012, available at <<http://online.wsj.com/article/SB10000872396390444734804578062331199029850.html>>.

agricultural bounty, oil-production and petroleum-related industries are looking more like the state's economic destiny, not soybeans, corn, or wheat production. Keeping with this energy theme for just a bit longer, it appears that the largest source of U.S. oil imports today, Canadian oil sands, did not even exist on a commercial basis prior to the 1970s.² Whether or not oil sands will top the U.S. import list is still being debated, but there is little doubt about a U.S. energy renaissance. According to forward-thinking global analysts on Wall Street, in Paris at the Organisation for Economic Co-operation and Development (OECD), and at the Organization of Petroleum Exporting Countries (OPEC) in Vienna, it is generally agreed that in less than a decade the United States will become the largest global oil producer — overtaking Saudi Arabia by the mid 2020s and becoming a net oil exporter by 2030.³ It is fair to say that many mainstream thinkers were simply caught off guard by these emerging energy trends. These energy surpluses, and their inherent opportunities, were not an unforeseen black swan or the consequence of some entirely unpredictable or even startling mix of whirlwind events.

Are there lessons development practitioners can learn from our colleagues in the energy world about the need to always be looking at alternative futures? Two obvious points come to mind. The first is that things change at lightning speed in today's fast-paced globalized world and "looking down" at today's challenges rather than "looking ahead" at emerging trends is a bad investment. Second, outcomes of interest are often unanticipated and rarely straight forward, but serious evidence-based, future-oriented analyses can help detect trends even if they are faint and inconclusive. Development interventions may not be subject to as abrupt or as dramatic a switch as the current energy revolution portends, yet not focusing on future development trends is a risky and bad policy. Looking at trends and alternative futures can only be ignored at our peril and, more importantly, at the expense of those we are trying to empower around the globe to have better and more productive lives.

The question development professionals should be addressing is, what if some of the hottest development enhancing interventions and technologies today — like *e-readers*, *bed nets*, *micro grid technology*, and *smart phones*⁴ — were found not to meet the rapidly changing needs of intended beneficiaries? What if development-solving products manufactured outside host countries were entirely supplanted by endogenous home-grown innovations over the next 7 to 10 years?

2 Daniel Yergin, *The Quest: Energy, Security, and the Remaking of the Modern World* (New York: Penguin Press, 2011).

3 *World Energy Outlook 2012*, International Energy Association, November 12, 2012, available at <www.worldenergyoutlook.org>.

4 The smart phones transformation is already under way. See Steven Gale and James Ehlert, "Tools for Peace: The Emerging Role of Science and Technology," in *Strategic Realities in Irregular Conflict*, 169–190, ed. Franklin D. Kramer and Melanne Civic (Washington, DC: Center for Naval Analyses, January 10, 2013), available at <www.cna.org/sites/default/files/research/Irregular_Conflict.pdf>.

Could any of those trends have been foreseen? What about upcoming new technologies like “3D-Printing”— which some say will revolutionize manufacturing in small-to-medium size enterprises or SMEs⁵ — so often the target of donor economic growth strategies? On the natural resource ledger, environmentalists and others have long pointed to future harmful impacts on biodiversity, degraded forests, and sea level rises, along with other negative global impacts on agriculture and food production resulting from global climate change. Fluctuations in precipitation patterns attributed to climate change have also been linked to increased risks, especially in the developing world, resulting in droughts, floods, storms, and tsunamis that can seriously undercut the sustainability and resilience of development projects. For example, the latest comprehensive scientific data show that polar ice sheets are melting at accelerated rates, raising sea level by almost a half inch since 1992.⁶

These and other emerging trends are already changing the shape of development interventions. But much less attention, if any, has been focused on other imminent trends, ranging widely from the massive private sector and government purchase or lease of farmlands in Africa,⁷ to unparalleled changes in higher education involving free, massively open online courses (MOOCs), available to millions of students globally, who only need Internet access,⁸ not traditional brick and mortar buildings and resident on-site faculty and instructors.

Similarly on the technology front, development professionals focused on promoting interventions revolving around off-grid energy, climate change, and water scarcity will need to pay much closer attention to ongoing and future advances in nanotechnology for example. Those innovations, some say, will revolutionize water purification, hydrogen storage, carbon capture, and agricultural systems with predictions that solar energy conversion will be cost competitive by 2015 and water desalinization by 2020.⁹ Nanotechnology products and applications are quickly coming of age and could have profound

5 Thomas Campbell, Christopher Williams, Olga Ivanova, Banning Garrett, *Could 3D Printing Change the World? Technologies, Potential, and Implications of Additive Manufacturing*, Strategic Foresight Report (Washington, DC: The Atlantic Council, October 2011); Connor M. McNulty, Neyla Arnas, and Thomas A. Campbell, *Toward the Printed World: Additive manufacturing and Implications for National Security*, Defense Horizon 73 (Washington, DC: Center for Technology and National Security Policy, September 2012).

6 Andrew Shepherd et. al. “A Reconciled Estimate of Ice-Sheet Mass Balance,” *Science* 338, no. 6111 (November 30, 2012), 1183–1189.

7 *Against the Grain: Land Grabbing and Food Sovereignty in West and Central Africa* (Barcelona, Spain: GRAIN, August 2012), available at <www.grain.org/article/entries/4575-land-grabbing-and-food-sovereignty-in-west-and-central-africa>.

8 Laura Pappano, “The Year of the MOOC,” *The New York Times*, November 2, 2012, available at <www.nytimes.com/2012/11/04/education/edlife/massive-open-online-courses-are-multiplying-at-a-rapid-pace.html?pagewanted=all&_r=0>.

9 Mihail C. Roco, Chad A. Mirkin, Mark C. Hersam, *Nanotechnology Research Directions for Societal Needs in 2020: Retrospective and Outlook Summary*, World Technology Evaluation Center, December 2010, available at <www.wtec.org/nano2>.

near and mid-term influences on sustainable development interventions producing cheaper, better, and more scalable solutions. For example, a recent lab experiment suggests that using specific light-absorbing nanoparticles — combined with just sunlight — can generate steam, which in turn, could fuel portable compact generator anywhere in the developing world to desalinate water, sterilize medical equipment, and increase food safety.¹⁰

Today versus Tomorrow

Focusing on future trends is just as much a challenge for the economic elites of the industrialized world as it is for developed, developing and emerging donors. Focusing only on proximal challenges is necessary, but short sighted. Let's look at Africa today as an example. Despite the emergence of new demands arising in Africa, many development practitioners essentially see big challenges revolving around ending malaria, preventing HIV/AIDS transmission, and curbing other infectious diseases like tuberculosis, avian influenza, and neglected tropical diseases. These are indeed some of today's most daunting health problems, but what about tomorrow's? Over the next decade, non-communicable diseases like obesity, diabetes, and cardiovascular disease will likely become the continent's next great health challenges. What other alternative futures should we be examining right now?

On the economic front over the past decade, Africa has recorded the *second fastest* regional growth in the world, just behind emerging countries in Asia, with 42 percent of the workforce *already engaged* outside commonly viewed traditional low-wage agricultural jobs.¹¹ Governance too is changing across the continent where there is a remarkable upswing with more than 20 democracies today in sub-Saharan Africa alone, from a low point of just three in 1989.¹² Africa is changing fast, and to keep up with future scenarios, donors and public and private partners must not only be on top of emerging development trends, but also be contributing substantively to the ongoing discussion. There is a general consensus, for example, that many of tomorrow's megacities will be in Africa. This means we must rethink how we envision future cities, not just in Africa. Are they just hubs for traditional economic growth strategies? What new infrastructure will be needed and how will education, water, power, and other essential government services be provided for these new megacities? To get a sense of the rapid global population rise in urban areas, think about adding the

¹⁰ Oara Neumann, Alex Urban, Jared Day, Surbhi Lal, Peter Nordlander, and Naomi J. Halas, "Solar Vapor Generation Enabled by Nanoparticles," *ACS Nano* 22, no. 1 (January 22, 2013), 42–29.

¹¹ David Fine et. al., *Africa at Work: Job Creation and Inclusive Growth*, McKinsey Global Institute, August 2012, available at <www.mckinsey.com/-/media/McKinsey/dotcom/Insights%20and%20pubs/MGI/Research/Labor%20Markets/Africa%20at%20work/MGI_Africa_at_work_August_2012_Full_Report.ashx>

¹² Steven Radelet, *Emerging Africa: How 17 Countries are Leading the Way* (Washington, DC: Center for Global Development, 2010).

equivalent of seven cities the size of Chicago, or five the size of London, annually over the next dozen years.¹³ What future *below-the-radar* implications need to be addressed now and over the next 10 to 15 years when thinking about these new cities? For example, today's global forecasts of urban expansion show dramatic implications for land use that threaten biodiversity and other ecosystems.¹⁴ If we expand the use of development-focused futures analysis, and its related tools such back-casting, gaming, horizon scanning, etc., we can help connect emerging trends and their development requirements with the present.¹⁵ Using the suite of futures tools, moving analyses to policy, and moving policy to action will ensure that the projects and programs being designed today will help address future critical needs, not obsolete ones.

Major Players

Which big institutions and organizations are really focused on tomorrow's *over-the-horizon* trends? Some would say that futures analysis was born after World War II at the request of the U.S. military. It was quickly adopted and advanced by the private sector, mainly the oil industry¹⁶ and over time, futures analysis became a central feature of today's U.S. intelligence community reporting.¹⁷ Outside the United States, a remarkable exception to promoting and using futures analysis resides within the Government of Singapore.¹⁸ This country has been a leader in utilizing analytic tools, visualization techniques, and scenario planning to "scan the horizon" to track emerging national security issues and distilling the findings for policymakers.¹⁹

Regardless of the exact genesis of futures analysis, it is clear that others outside the development community have intently and consistently focused on identifying emerging trends that impact their strategies, budgets, clients, and

- 13 *Global Trends 2030: Alternative Worlds*, National Intelligence Council, NIC2012-001, December 2012, available at <www.dni.gov/nic_2030>.
- 14 Karen C. Seto, Burak Guneralp, and Lucy R. Hutyra, "Global Forecasts of Urban Expansion to 2030 and Direct Impacts on Biodiversity and Carbon Pools," *Proceedings of the National Academy of Science* 109, no. 40 (October 2, 2012) 16083–16088.
- 15 Steven Gale, *Connecting the Future with the Present*, USAID, June/July 2011, available at <www.usaid.gov/press/frontlines/fl_jun11/FL_jun11_FUTURES.html>.
- 16 Ben Ramalingam and Harry Jones, *Strategic Futures Planning: A Guide for Public Organizations*, the Overseas Development Institute, September 2007, available at <www.odi.org.uk/publications/216-strategic-futures-planning-public-sector-organisations>.
- 17 *Global Trends 2025: A Transformed World*, National Intelligence Council, NIC2008-003, November 20, 2008, available at <www.acus.org/publication/global-trends-2025-transformed-world>.
- 18 Other foreign governments using futures analysis include Finland, France, South Africa and South Korea. See Jerome C. Glenn, Theodore Gordon, and Elizabeth Florescu, 2011: State of the Future, The Millennium Project, Washington, DC, available at <www.millennium-project.org/millennium/2011SOF.html>.
- 19 *The International Risk Assessment and Horizon Scanning Symposium Report 2011*, Government of Singapore, October 18, 2011, available at <<http://app.rahs.gov.sg/public/www/home.aspx>>.

national interests. The development community has only just begun to take futures analysis seriously. USAID must become a wiser steward of tax payers' foreign assistance dollars. The Agency's programs must be more impactful, and more resilient. To achieve these goals, futures analysis must become an indispensable part of our analytical approach for development in every phase of our planning cycle, policy formulation, and on-the-ground programming. This recognition, along with support from top USAID leadership, was the driving force behind the Symposium on Future Development Challenges held in Washington in late 2011.

Early but Limited Success

To be accurate, there were some notable early attempts at futures analysis in the civilian world. Back in 2005, the U.S. State Department and USAID, along with over two dozen civilian counterpart Federal agencies, dove head-first into futures analysis by asking about different alternative "world scenarios" such as growing and widespread food insecurity, emerging pandemics, mounting climate change threats, and other global circumstances likely to face the U.S. Government over the next 10 to 20 years. Project Horizon, as it was called, also focused on examining interagency capabilities to deal with alternative future worlds, building internal analysis capacity by conducting scenario-planning exercises, and strengthening interagency coordination to deal with 2025 global possibilities.²⁰ Project Horizon was way ahead of its time by recognizing that while accurately forecasting the future was not always possible, developing plans for a range of alternative futures was absolutely vital.

In the end, Project Horizon was short lived. It found little traction after its initial two-year-long set of meetings and joint exercises. It is more "natural" inside civilian government agencies to focus on here-and-now realities like budget threats, staffing issues, and the inevitable consequences of changes in administrations and leadership direction. Regrettably, the tyranny of today's issues is hard to successfully and consistently buck in most institutions. Two other factors which dealt Project Horizon a short "half-life" was not being threaded from the start into the political agenda of top agency leadership nor connected to ongoing business processes.

It takes a concerted ramp-up effort to build futures analysis capabilities and assign responsibility for who will take it on, year after year after year. And, it takes an even greater effort to sustain and grow futures analysis capabilities to withstand the perennial organizational re-makes. For futures analysis to have a chance of succeeding, buy-in is needed from top-level agency political leadership and from bottom-level career practitioners. Even when futures analyses are

²⁰ *Project Horizon Progress Report* (Washington, DC: Interagency Strategic Planning Coordinating Conference, 2006).

conducted and made available to decision-makers at all levels, there is no guarantee they will use it. Part of the solution at USAID therefore must be to communicate the significance of the trends, the perils averted if we take them into consideration, and then incentivizing use of the information by those in Washington and among our 80-plus field missions.

It is worth noting that a number of the future scenarios posited by Project Horizon are today's realities, such as a diminished problem-solving role for the United States globally, the sometimes chaotic and unexpected paths of new democracies (does this sound familiar?), and an upswing in non-state actors (both good and bad) on the global scene. Before letting Project Horizon go, one final "Big Idea" that emerged, and was applicable across all the scenarios, was the outsized role that Federally-funded science, technology, and engineering investments could play in addressing long-term global challenges combined with academic and private sector partnerships. This notion of leveraging the scientific know-how of Federal labs like those at the National Aeronautics and Space Administration (NASA), National Oceanic and Atmospheric Administration (NOAA), National Science Foundation (NSF), National Institutes of Health (NIH), and Department of Defense (DOD) today has found a permanent home today at USAID, becoming an essential pillar of the Office of Science and Technology.²¹

Emerging Development Trends

The goal of the Symposium on Future Development Challenges was to wrestle with emerging trends and unknown challenges not easily predicted by past events, un-hitched from traditional linear thinking, and freed from looking at just low-risk, incremental — rather than high-risk but game-changing — development solutions. In the very broadest terms, USAID had previously identified six key likely trends that are quickly reshaping — and will continue to shape — the global development landscape.

- Economic spurts: The global economy is growing at multiple speeds;
- Population shifts: Demographic trends are complicating development challenges;
- Knowledge entree: Knowledge access is growing exponentially as connectivity explodes globally;
- Event speed-up: Shocks are reverberating more quickly and more widely than ever before;
- Escalating good governance: Democratic governance is expanding

²¹ See USAID Office of Science and Technology, Homepage, available at <<http://transition.usaid.gov/scitech/>>.

globally, but haltingly; and,

- Changing development ecosystem: A new “aidscape” is briskly emerging with new partners, new approaches, and new models.²²

These development-focused trends laid the foundation for the symposium on which this book is anchored. We also borrowed unabashedly from the findings of the U.S. National Intelligence Council’s (NIC) in-depth trends analysis to expand the symposium and stimulate discussions on issues such as the unprecedented rise of emerging political players and economic powerhouses like Brazil, Russia, India, China, and Indonesia, and the chance for major economic downswings in sub-Saharan Africa where USAID is heavily engaged.²³ The NIC report also pointed to sizable demographic shifts over the next 20 years, with virtually all real population growth occurring in Africa, Asia and Latin America and youth bulges in sub-Saharan Africa and the Middle-East. Again, these trends raised concerns as many countries within these geographical regions are current recipients of significant USAID development assistance. Beyond these economic and demographic trends, the NIC report highlighted a number of future climate change trends in the development space that USAID has been engaged in for many years, including water management, agricultural production, and natural resource management practices.

From a purely developmental perspective, the NIC report underscored the exceptional speed at which technology was advancing in the developing world. USAID’s own future trends analyses, combined with the NIC’s assessment, led to building the symposium around four distinct tracks: *population*; *science, technology, and society*; *politics and economies*; and *environmental* issues.

While the NIC’s report focus was predominantly on national security issues, their analyses have proved to be a highly valuable guidepost to future development trends. This is not a surprise as the once hard edges between defense, diplomacy, development and intelligence have become less clear cut. Findings from the latest NIC report highlight such issues as a rapidly aging population for some countries versus an increasing youthful population for others; a rising consuming class in most countries with attendant demands for political change; and the emergence of more than a dozen “disruptive technologies” — from precision farming to distributed power — aimed at addressing growing global challenges from rapid urbanization, energy shortfalls, water and food scarcity, among other stressors.²⁴

²² *USAID Policy Framework 2011–2015* (Washington, DC: USAID, 2011), available at <http://transition.usaid.gov/policy/USAID_PolicyFramework.PDF>.

²³ *Global Trends 2025: A Transformed World*, National Intelligence Council, NIC2008-003, November 20, 2008, available at <<http://www.acus.org/publication/global-trends-2025-transformed-world>>.

²⁴ *Global Trends 2030: Alternative Worlds*, National Intelligence Council, NIC2012-001, December 2012, available at <www.dni.gov/nic_2030>.

Going Short

Building futures analysis capabilities and simultaneously creating incentives for decision-makers to use is vital for impactful development assistance aimed at fighting poverty, reducing hunger, increasing livelihoods and advancing good governance. Thus far, the intention of this chapter has been to make a strong case that more focus and attention needs to be devoted to addressing emerging development trends like the youth dividend, urbanization, the senior bulge, and looming threats to biodiversity. Adjusting programs accordingly is equally important; otherwise the development interventions we are operationalizing today will be way out of synch with the future needs of those in the developing world. At the same time, if we do not also focus our analytic capabilities on better digesting the reams of existing development data now increasingly available, so-called Big Data, we will likewise fall short of our real goal. “Going Short” refers to the need to have reliable and accurate *real-time feedback* for newly implemented and ongoing development projects combined with deep-dive analyses of current data from multiple sources to help understand the current development challenges.

Big Data, one way or another, has been around for some time but the digital age has brought with it a quantum leap in the volume and complexity of what is available to support development analysis and decision-making. It is not only the sheer volume of development and related data that is available, but the growing diversity of data generators. From an expanding circle of individual data users via mobile phones, Tweets, and blogs to traditional institutional data, these resources are now being made openly and widely available by the World Bank and U.N. agencies. That includes data from USAID to support the agencies “open development” initiative. Add to that information reservoir, volumes of figures, facts, trends and statistics from remote sensing via satellites, computer mapping, geographic information systems, and quantitative modeling and you begin to get an inkling of what Big Data is all about.²⁵ Most of this data is from public sources, but the real gold mine is the yet untapped data streams in the private sector. For example, it has been reported that Walmart transmits more than 1 million transactions an hour into its corporate databases estimated at more than 2.5 petabytes.²⁶ “Going Short” will allow development planners to carefully analyze current data flows that are already changing reality.²⁷

25 For a discussion of sweeping changes in how big data for development is being optimized see Aniket Bhushan, “Big Data” in *USAID Frontiers in Development*, Rajiv Shah and Steven Radelet, ed, 152–156 (Washington, DC: U.S. Department of State, May 2012).

26 Dan Brody, *Big Data: Harnessing a Game-Changing Asset*, Economist Intelligence Unit, September, 2011, available at <www.sas.com/reg/gen/corp/1583148>.

27 Emmanuel Letouze, *Big Data for Development: Challenges and Opportunities*, United Nations Global Pulse (New York: United Nations, May 2012).

Two Final Thoughts

Optimal outcomes sought by the development community and our partners in the private sector, philanthropic, and foundational worlds will benefit from fresh thinking and subsequent actions that better recognize the importance of emerging trends to achieve long lasting impacts, build resilient communities, and empower governments at every level to improve the quality of life for all their citizens. Futures analysis should not be a “day” you set aside for a symposium, but rather something that development professionals do *every day*. Futures analysis should be at the very heart of the discipline and science of development. In the end, “Going Long” must be accompanied by “Going Short” in that long-term thinking must complement new breakthrough analytics emerging from Big Data. Development professionals have increasing access to more and highly sophisticated data than ever before, but the trick is turning it into useful and actionable insights. Both long and short approaches rely on the increasing need for development planning to be more evidenced-based and anticipatory.

The development community must also continue to break free from the near-linear thinking that has dominated our past. Future worlds will surely be more complicated and problematic. Today’s solutions to solve tough development problems were born of a more ordered, structured, logical and stable world. The future will have more players, events will be more intertwined, the speed of change more swift, and the problems more “wicked” to solve. Greater focus on futures analysis will give us a leg-up to have more impactful and resilient development programs now and over the horizon.

Steven Gale *Senior Advisor for Strategic Opportunities, Office of Science and Technology, U.S. Agency for International Development (USAID)*

Part 2

The Four Symposium “Tracks”

Populations

Science and Technology

Politics and Economies

Environment

Populations

There are now 7 billion people on the planet, and more than half of them live in urban areas.

The Population Reference Bureau projects that by 2025, 27 megacities will exist. Twenty-one of these will be in less developed countries, mainly in Africa and Asia. It is clear that current and future demographic trends will have a profound impact on development today and into the next decade. During the *populations* panels, issues concerning changing demographics, transnational networks, urbanization, governance mechanisms and strategies needed to cope with these changes received considerable attention.

Much of the day's discussion focused on the demands created by growing resource scarcity. Population growth coupled with urbanization and climate change will, according to the panelists, put significant stress on water, food, and energy. A rising middle class in many developing countries will mean increased demand for more goods and services. Participants emphasized the importance of anticipating these shortages using futures analysis tools and other methods and of developing policies and plans to meet these challenges. Planning

for food security, disaster resilience, and adaptation, for example, will be imperative in order to synchronize development aid and population needs.

A related theme that dominated discussion was that of migration both within countries and beyond national borders, from which two trends emerged. First, people are moving to cities in record numbers. As cities expand, so do the informal settlements that surround them. Seventy-two percent of the urban population of Africa lives in slums. This creates both challenges and opportunities for development work. On the one hand, populations living in informal settlements can be difficult to track and monitor. Improving sanitation, clean water, and educational services presents major challenges for urban planners. At the same time, information dissemination campaigns and family planning initiatives can be extremely successful because organizations can reach so many people

without having to travel miles and miles.

The second trend of migration that was highlighted involves people moving away from their homelands. Natural disaster, conflict, and economic gain are all drivers of human migration. As climate change continues to impact the globe, there will be continued drought in the Sahel and increased flooding in Southeast Asia. Coastal cities are particularly vulnerable because of their proximity to rising sea levels as well as high population density. In the wake of natural disasters, will these people relocate or will they rebuild? And if they rebuild, what guidance and advice can development agencies provide to increase resiliency?

Another theme discussed was what many refer to as the “youth bulge.” One in five people are between the ages of 15 and 24. The vast majority of these youth live in less developed countries. While some argue this “youth bulge” poses a threat to stability, many of the panelists highlighted

the importance of leveraging the “demographic dividend.” The key, they argued, is to empower these youth to become agents of positive social change. In order to do this, development initiatives need to focus on requisite education, creating better job opportunities, and widespread economic growth.

Speakers went beyond discussing future megatrends like population growth and their associated perils. One area of concern revolved around the need for aid organizations to develop or refine existing policies to accommodate and even anticipate these changes.

There was also major discussion about how development organizations like USAID might place increasing emphasis on programs and projects that involve the latest urban planning tools, youth employment strategies, and the wider distribution of public services. Geographic information systems (GIS) tools, for example, can provide new ways to map and analyze

population movements and other demographic shifts. It was also noted that public-private partnerships are more important than ever as they can work to address these challenges.

Transnational networks resulting from human migration were also discussed. New ideas on the issue of resettlement are needed now. For example, are there alternatives to traditional refugee camps? Other issues that surfaced included growing donor fatigue, an aging population with declining tax revenue but increased medical and health demands, and the potential for population and migration-induced ethnic and religious conflict.

The Future out to 2030: According to Demography

Richard Cincotta expertly lays out how population age-structures and demographic projections are vital, yet rarely examined, indicators for future development-focused programming and decision-making.

It came as no surprise that the mention of demography generated lively discussions during all three themes at the U.S. Agency for International Development's (USAID's) Futures Symposium. Demography arose not only in the session focused on *populations* as some might expect, but also in discussions of the future of *science and technology*, the session on *politics and economies*, and throughout discussions of future threats to the *environment*. These discussions highlighted the cross-cutting nature of the demographic transition from high to low rates of birth and death, political stability, social and educational progress, institutional capacity, and urbanization patterns.

Because the effects of the demographic transition are enmeshed deeply in such a broad range of development issues, published projections — data generated by theorists to quantify the demographic future — offer a valuable tool for development-centered futures analysis. Updated biennially by the United Nations Population Division and less regularly by the U.S. Census Bureau's International Program Center, demographic projections perform with reasonable accuracy over at least two decades. Given the steadily improving track record of these two sources of demographic projections since 1980,²⁸ USAID's policy analysts and foresight researchers may find it worthwhile to consider the demographic methods used in this chapter as tools to support improved program planning and country-level strategizing.

28 Nico Keilman, "How Accurate Are the United Nations World Population Projections?" *Population and Development Review* 24, supplemental (1998) 15–41.

The chapter begins with an overview of the most salient conclusions of recent research in political and economic demography. It then outlines a framework that should help policymakers apply these conclusions, describes in detail the framework's four discrete age-structural "stages," and maps the global distribution of these stages, both in 2010 and in 2030. The chapter highlights factors arising within each age-structural stage that contribute favorably to, or bear unfavorably on, the management of states and their institutions. The dynamics of ethno-religious age structures at the sub-national level are also discussed. The chapter ends with a brief discussion of the broader implications of demographic research for futures analysis.

Major Conclusions

Recent research in political and economic demography indicate that the degree of age structural "maturity" (the relative distribution of children, adolescents, working-age adults and seniors in a country's population, which is reflected by the median age) has significant effects on a country's political, economic and social conditions, and future trends. Age-structural maturation, advances in the median age, has largely been the product of declines in women's fertility. The trend toward longer life expectancies at old age has also contributed to shifts toward more mature age structures.

Some configurations that evolve during the transition from younger to more mature age structures, the age structural transition, appear to be more "unfavorable" than others. In other words, some age structures are associated with conditions that make governance and development difficult, while other more "favorable" age structures make economic and social progress less of a challenge. Empirical evidence indicates that the most challenging age structures predominate during the earliest (youthful) stage of the age-structural transition, where more than half of the population is at, or below, 25 years of age.²⁹ Over the past four decades, states with a youthful age structure have proven to be the most vulnerable to outbreaks of intra-state conflict and political instability.³⁰ Theoreticians expect age-related challenges to governance to also surface in the

29 The selection of the median age of 25.0 years as the border for the most youthful age-structural stage is a conversion from other highly correlated "youth-bulge measures" is drawn from Henrik Urdal. "A Clash of Generations? Youth Bulges and Political Violence," *International Studies Quarterly* 50, no. 3 (September 2006), 607–629; Richard P. Cincotta and Elizabeth Leahy, *Population Age Structure and Its Relation to Civil Conflict: A Metric*, Report 12 (Washington, DC: Environmental Change and Security Program, 2006–2007), 55–58; Christian G. Mesquida, and Neil I. Wiener, "Male Age Composition and the Severity of Conflicts," *Politics in the Life Sciences* 18, no. 2 (2001), 181–189. Also see: *Global Trends 2030: Alternative Worlds*, National Intelligence Council, NIC2012-001, December 2012, available at <www.dni.gov/nic_2030>.

30 Henrik Urdal. "A Clash of Generations? Youth Bulges and Political Violence," *International Studies Quarterly* 50, no. 3 (September 2006), 607–629; Richard P. Cincotta and Elizabeth Leahy, *Population Age Structure and Its Relation to Civil Conflict: A Metric*, Report 12 (Washington, DC: Environmental Change and Security Program, 2006–2007), 55–58; also see Richard Cincotta, Robert Engelman and Daniele Anastasion, *The Security Demographic: Population and Civil Conflict After the Cold War* (Washington, DC: Population Action International, 2003).

latest (post-mature) stage, and for these economic and administrative difficulties to be linked, in various ways, to the extraordinary fiscal demands and program constraints posed by the emergence of large proportions of seniors and elderly, characteristic of this stage of the age-structural transition (a median age greater than 45 years).³¹

Current demographic projections suggest that the coming two decades will be a period of substantial, if not unprecedented, age-structural change. Projected outcomes will pressure some states and international institutions to use their political power and financial resources to avoid, reduce, mediate and react to detrimental demographic conditions — specifically, those precipitated by an unfavorable age structure and those with a shifting ethno-religious composition. Thus, many of the methods used in this chapter should be of interest to development analysts and policymakers alike. Many of the demographic conditions discussed in this chapter can be forecasted using demographic projections, giving analysts and policymakers an objective view of a future two decades hence.

Several noteworthy forecasts can also be drawn from age-structural political demography:

Instability

By 2030, youthful age-structural conditions will likely continue to contribute to instability in the Middle East (Yemen, Iraq, West Bank and Gaza), South Asia (Afghanistan, in the peripheral regions of Pakistan and perhaps in several states in north-central India), across the tropical mid-section of sub-Saharan Africa (West, Central and East Africa), and in the island states of Timor-Leste (East Timor), Papua New Guinea and the Solomon Islands along the Pacific Rim. For the vast majority of those states that retain youthful populations into the future, there is a low probability of a rise to, or maintenance of, high levels of democracy. For those that succeed, there are likely to be high costs in government resources, lives and property.

Democracy

Current age-structural projections suggest that some countries of North Africa, specifically those of the Maghreb (Tunisia, Algeria, and Morocco), are likely to continue to trend toward democracy. In the early and mid-2020s, analysts should expect further political changes in Muslim-majority states in the Middle East (the Mashreq) and Central Asia (the ex-Soviet Asiatic republics) as their age structures mature. During the 2020s, analysts should also expect to witness the

31 Richard Jackson, and Neil Howe, *The Graying of the Great Powers: Demography and Geopolitics in the 21st Century* (Washington, DC: Center for Strategic and International Studies, 2008). Nicholas Eberstadt and Hans Groth, *Demography and Public Debt: Time for a "Demographic Stress Test" for the Western Economies. What Does It Mean for Switzerland?* (St. Gallen, Switzerland: University of St. Gallen, 2010); Also see: Richard Cincotta, "Demography: A Development Perspective," in *Security and Development in Global Politics: A Critical Comparison*, ed. Joanna Spear and Paul D. Williams, 291–310, (Washington, DC: Georgetown University Press 2011).

devolution of monarchical power among the remaining Middle Eastern monarchies.

Latin America

The projected pace of age-structural maturation in Latin America indicates that many of the region's states should be expected to trend toward increasing economic stability and democratization. For the larger states of the region — including Brazil, Mexico, and Colombia — this trend should translate to greater geopolitical power. In this region, development is likely to be slowest in Guatemala, which is projected to remain youthful through 2030. Haiti, Honduras and Bolivia, although slowly maturing, will likely lag behind the rest of Latin America in assessments of social, economic, and political progress over the next two decades.

Aging Populations

For advanced aging populations in Japan and Europe, one should expect rising political clamor triggered by pension and tax reforms, and realignments of government-provided services as states maneuver through the fiscal pinch caused by rising old-age dependency. That said, even as their workforce size declines, these human-capital-rich nations may witness novel institutional and technological adaptations that could shift future economic trajectories. As economic growth becomes increasingly decoupled from job growth, slow declines in workforce size could have fewer negative impacts than currently assumed.

Ethno-Religious Patterns

When strategists look to the world of 2030, they should consider the implications of ongoing ethno-religious shifts, particularly in the Central Andes, in parts of the Middle East, and in Western Europe. These shifts may ultimately have national and even international political significance.

Age-Structural Transitions

Countries that are transitioning from high to low levels of fertility and longer adult life expectancies are, as a result, being driven through an age-structural transition — a succession of age distributions of increasing median age. While the level of fertility and the pace of its decline are the principal drivers of changes in population age distribution, other demographic forces — childhood mortality, inter-country migration, and premature adult mortality, such as through AIDS-related death, exert more subtle effects. These and the passage of time influence the position of countries along the path of the age-structural transition (Figure 1).

When USAID began its bilateral assistance programs in the mid-1960s, roughly 80 percent of all independent states — virtually all of the developing

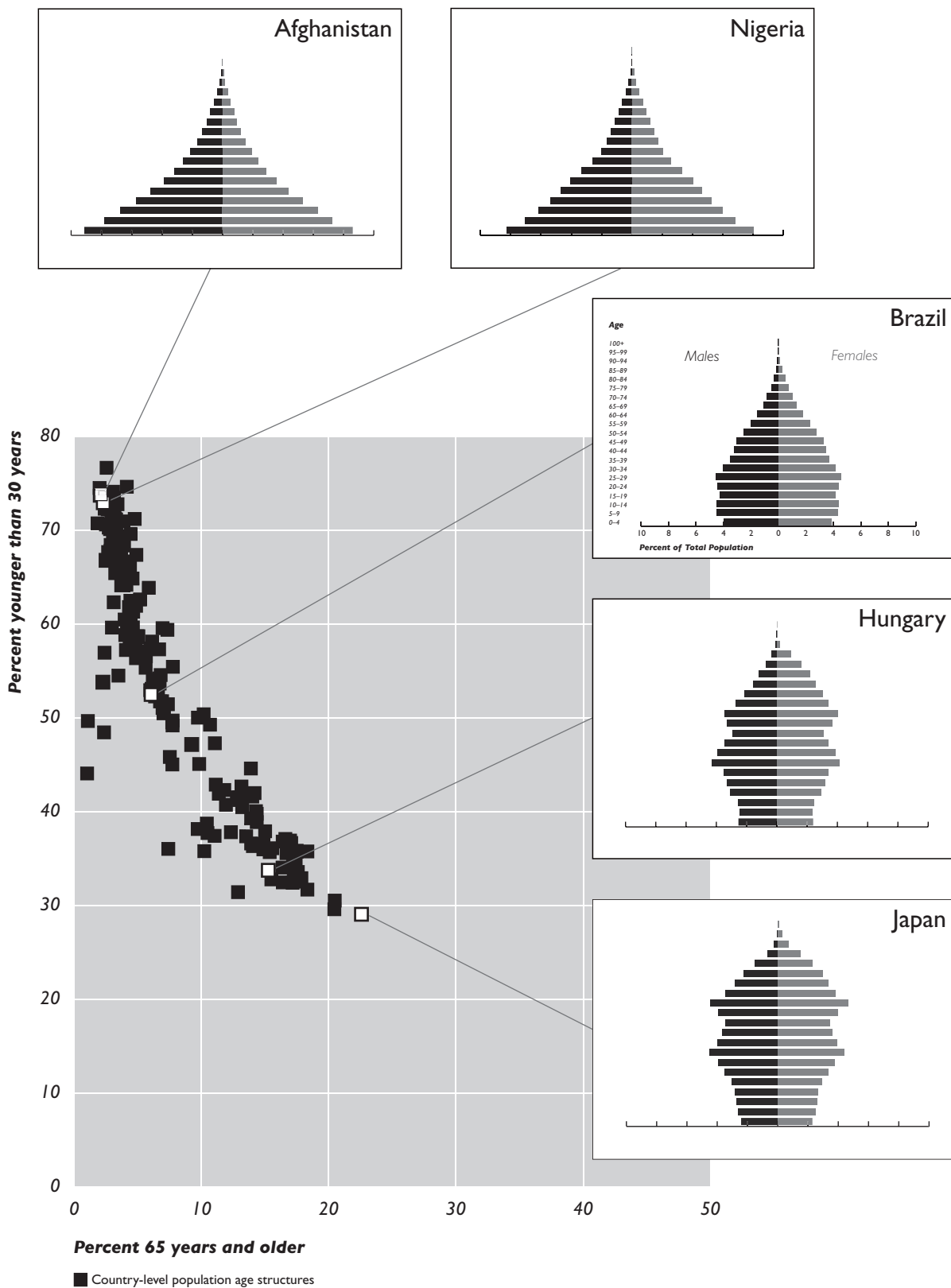


Figure 1

The distribution of country-level age structures in 2010, graphed by the proportion below age 30, and the proportion 65 years and older. The principal direction of movement along this path has been down and to the right, driven by fertility decline and longer life spans. As the graph suggests, some country-level populations have moved, at various instances, in other directions — to the left, to the right, or even upwards, driven by the forces of migration, increasing adult mortality, and decreasing infant mortality. Data are estimates from the United Nations (UN) Population Division's 2010 Revision.³²

world — experienced age structures with more than 60 percent of their population under age 30. At that time, not a single state had accumulated a proportion of seniors (over 65 years old) that was greater than 15 percent of the total population. By 2010, just over 40 percent (80 states) remained in that youthful condition, whereas 23 states had matured beyond the point where seniors comprised more than 15 percent of the population.

Although the age-structural transition is a continuous process, the differences in state behaviors that occur at various positions along this lengthy continuum can be better understood by breaking the transition into four “stages” (Figure 2). Each stage spans a 10-year interval of *median age* (the age of the person for whom 50 percent of the remaining population is older, and 50 percent is younger).³³ The four discrete stages of this categorical system, and their range of median ages are: *youthful* (with a median age equal to, or less than 25 years), *intermediate* (greater than 25 and equal to, or less than 35 years), *mature* (greater than 35 and equal to, or less than 45), and *post-mature* (greater than 45 years).

For most independent states, the use of the country-level median age works sufficiently well to indicate the maturity of a country's age structure. Values for this indicator are estimates and projections published by the U.N. Population Division (for an alternative source, see the U.S. Census Bureau's International Data Base (IDB)).³⁴ For the six states of the Gulf Cooperation Council (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates) the analysis discussed in this chapter uses the median age of citizen residents only, rather than

32 *World Population Prospects, the 2010 Revision* (New York: United Nations, 2011), available at <<http://esa.un.org/wpp/>>.

33 Richard P. Cincotta and Laurel Hummel, “Africa's Youthful Age Structure and Its Security Implications,” in *Africa's Strategic Geography*, ed. Amy Richmond Krackowa and Laurel Hummel, 257–282 (Carlisle, PA: U.S. Army War College and U.S. Military Academy, 2009); for alternative systems see Elizabeth Leahy, Robert Engelman, Carolyn G. Vogel, Sarah Haddock, and Tod Preston, *The Shape of Things to Come: Why Age Structure Matters to a Safer, More Equitable World* (Washington, DC: Population Action International, 2007); Bo Malmberg and Lena Sommestad, “The Hidden Pulse of History: Age Transition and Economic Change in Sweden, 1820–2000” *Scandinavian Journal of History* 25, no. 1, (2000), 131–146; Monica Buvinic, Monica D. Gupta, and Ursula Casabonne, “Gender, Poverty and Demography: An Overview,” *World Bank Economic Review* 23, no. 3 (2009), 347–369.

34 Population data, by age and sex, published by the United Nations are available online and in CD format. See *World Population Prospects, the 2010 Revision* (New York: United Nations, 2011), available at <<http://esa.un.org/wpp/>>; Similarly structured data are available online from the U.S. Census Bureau via the International Program Center's International Data Base, available at <www.census.gov/population/international/data/idb/informationGateway.php>.

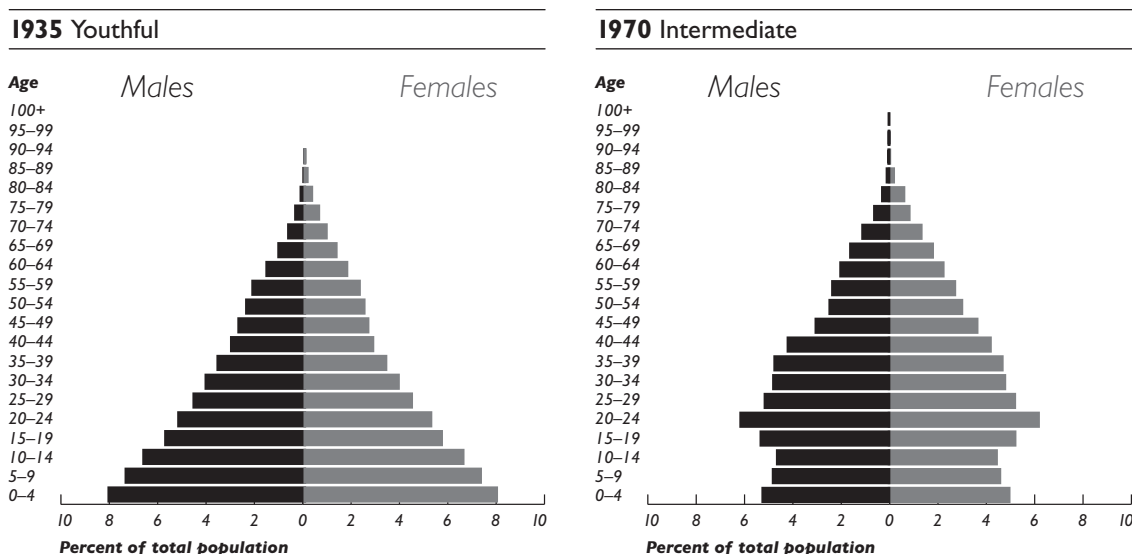


Figure 2

Japan's age-structural transition, 1935 (estimates) to 2025 (projections, UN medium fertility variant). Whereas the age-structural transition is a continuous process, this figure uses Japan's transition to illustrate the four discrete age-structural stages that are employed in the analysis.

the mixture of citizen and non-citizen residents that are aggregated in the U.N. and U.S. Census Bureau estimates and projections.³⁵

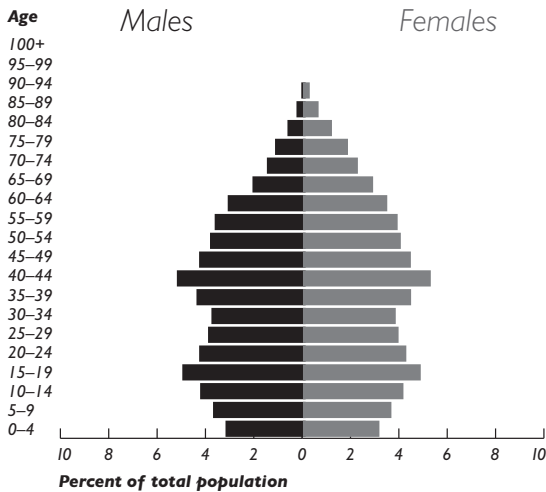
Before describing these specifics of each of the four stages, it is useful to discuss the general pattern that emerges from the results of political and economic research comparing countries at different positions along the age-structural transition. This transition is a “bad news, good news, bad news story.” Virtually all of today’s independent states were first established with age-structurally unfavorable conditions — at median ages below 20 years, and with high levels of fertility and low levels of educational attainment. By and large, the arrival of states into the intermediate and mature stages of the age-structural transition has generally been associated with increasingly favorable economic, social and political conditions. Most analysts foresee the aging of populations into the post-mature category as a shift to generally unfavorable economic and political conditions. How unfavorable will these age structures become in the future, and how well can they be managed? That remains to be seen.

Youthful Age Structures

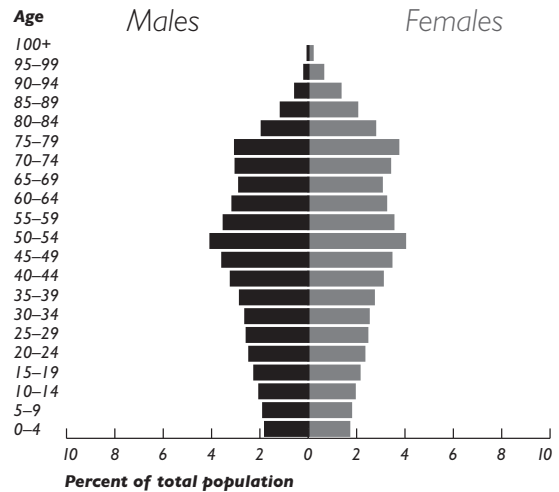
Sustained high fertility (typically five children per woman and above) was a social

³⁵ The citizen-resident median age for each of the Gulf Cooperation Center states was calculated from unpublished disaggregated data used by the U.S. Census Bureau’s International Program Center to produce country-level estimates and projections for these six states.

1990 Mature



2025 Post-Mature *projected*



fixture of all human history. Due to state-financed improvements in water quality and sanitation, declines in infant mortality began to take hold in Europe in the latter decades of the 18th century and spread worldwide in the two centuries thereafter. The result: even more youthful age structures than ever before. During the 20th century, the median age of some countries dropped to a median age of 15 (for example, Kenya in the 1980s) or below (Yemen in the 1990s). Even now, that youthfulness — and its associated challenges — prevail along the tropical midriff of sub-Saharan Africa, in parts of the Middle East and South and Central Asia, and among the Islands in the southern Pacific. Some of it is projected to persist past 2030 (Figure 3).

For developing states, youthful age structures present unparalleled challenges. Their high proportions of children, adolescents, and young adults and the rapid rate of these groups' advancement into schooling and job markets, undermine education and health infrastructure, constrain governmental and parental investments, and outpace the supply of new jobs. Recent ethnographic literature highlights mutual reinforcing relationships between large family size (high fertility), risk-averse extended family networks, and clan-based and factional patron-client arrangements.³⁶ Others have linked these arrangements to nepotistic corruption³⁷ and to the power of political entrepreneurs who can destabilize states.³⁸

Those who have focused on the politics of youthful age-structural

36 Onipede Wusu and Uche C. Isiugo-Abanihe, "Interconnections Among Changing Family Structure, Childrearing and Fertility Behaviour Among the Ogu, Southwestern Nigeria: A Qualitative Study," *Demographic Research* 14, no. 8 (2006), 139–156; Daniel J. Smith, "Contradictions in Nigeria's Fertility Transition: The Burdens and Benefits of Having People," *Population and Development Review* 30, no. 2 (2004), 221–239.

37 Benjamin C. Mbakwem and Daniel J. Smith, "Returned to Sender": Corruption in International Health," in *The Practice of International Health: A Case-Based Orientation*, ed. Daniel Perlman and Ananya Roy, 217–230 (Oxford: Oxford University, 2008).

conditions assume that the surge of young adult males depresses the costs of political mobilization.³⁹ This dynamic sets up a *recruitment contest* — competition between state and non-state actors who, by appealing to identity and ideology, vie to mobilize young-adult males to advance their political and military goals. Statistically, youth-bulge states suffer an elevated risk of a violent outbreak of intrastate conflict⁴⁰ and, as a group, experience reduced odds of attaining and maintaining a stable liberal democracy when compared to more demographically mature states.⁴¹

The “25-and-younger” criterion serves as a useful marker for states at risk of various forms of internal violence and political instability, now and over the coming decade. Since 1970, states with a youthful population have comprised about 80 percent of each decade’s newly emerged intrastate conflicts.⁴² Notably, revolutions during this transitional stage can be extraordinarily violent and, if successful, may end with the near-complete dispossession of the political, commercial, and military elites. After states have surpassed the median age of 25 years, analysts should expect them to be less likely to initiate a new intrastate conflict, more likely to experience the winding down of an ongoing civil or ethnic war, and more likely to experience sustainable democratization.

Intermediate Age Structures

Should fertility continue to fall, youthful countries enter the intermediate stage of the age-structural transition, a more economically and politically “favorable” series of intermediate age structures (a median age from 25 to 35 years) that are proportionally dominated by relatively young working-age adults, and fiscally encumbered by relatively few childhood dependents or elderly. These are the age

- 38 Roel Van Der Veen, *What Went Wrong With Africa: A Contemporary History* (Amsterdam: KIT, 2004); Fatton, Robert, “Bringing the Ruling Class Back In. Comparative Politics,” 20, no. 3 (1988), 253–264; James C. Scott, “Patron-Client Politics and Political Change in Southeast Asia,” *American Political Science Review* 66, no. 1 (1972), 91–113.
- 39 Henrik Urdal, “A Clash of Generations? Youth Bulges and Political Violence,” *International Studies Quarterly* 50, no. 3 (2006), 607–629; Richard P. Cincotta, “Demographic Challenges to the State,” in *Security and Development: Searching for Critical Connections*, eds. Necla Tschirigi, Michael S. Lund, and Francesco Mancini, 77–98 (New York: Lynne Reinner, 2009); Hannes Weber, “Demography and Democracy: the Impact of Youth Cohort Size on Democratic Stability in the World,” *Democratization* 20, no. 2 (2013), 335–357.
- 40 Henrik Urdal, “A Clash of Generations? Youth Bulges and Political Violence.”
- 41 Richard P. Cincotta, “How Democracies Grow Up,” *Foreign Policy* (March/April 2009), 80–82; Richard P. Cincotta, “Half a Chance: Youth Bulges and Transitions to Liberal Democracy,” *Environmental Change and Security Program Report* 13, (2008/2009), 10–18, available at <www.wilsoncenter.org/publication/half-chance-youth-bulges-and-transitions-to-liberal-democracy>; Richard P. Cincotta and John Doces, “The Age-Structural Maturity Thesis: The Youth Bulge’s Influence on the Advent and Stability of Liberal Democracy,” in *Political Demography: How Population Changes Are Reshaping International Security and National Politics*, ed. Jack A. Goldstone, Eric Kaufmann and Monica Duffy Toft, 98–116 (Oxford: Oxford University Press. Weber, 2012); Timothy Dyson, *On the Democratic and Demographic Transitions*, (London: London School of Economics, 2012), 19.
- 42 Richard P. Cincotta and Elizabeth Leahy, “Population Age Structure and Its Relation to Civil Conflict: A Metric,” *Environmental Change and Security Project Report* 12 (2006/07), 55–58.

structures that many identify with a demographic bonus. Countries in this stage typically experience the rapid accumulation of educated and skilled young workers (human capital) and some also benefit from high rates of household and government savings.⁴³

Within countries moving through the intermediate category, the majority of newly established households are converging on a small family size, affording greater parental and government investments in education and health per child, and opportunities for women to engage in employment. Such changes are likely to strain extended-family networks and could weaken clan and patron-client systems.⁴⁴

Among the export-oriented East and Southeast Asian states, entry into this stage of the transition led ultimately to growth in wages, to the entrance of a large proportion of women into the workforce,⁴⁵ and to the broadening of the middle class. Because Latin America's fertility decline lagged behind East Asia's, and the region's governments, on the whole, were slower to invest broadly in public education,⁴⁶ economists have raised questions about how much of an economic boost or a demographic dividend their intermediate age structures will ultimately deliver.⁴⁷ While some analysts see signs of an impending economic take-off, it is still early — much of Latin America, particularly Mexico and other Central American states, are in the early portions of the intermediate stage of the age-structural transition.⁴⁸

While youthful intrastate conflicts often persist into the intermediate category, insurgencies faced with withering recruitment tend to withdraw from troop-intensive operations — as in the case of the Provos⁴⁹ in Northern Ireland in the late-1980s,⁵⁰ the Tamil Tigers in Sri Lanka in the 2000s,⁵¹ and now the FARC in Colombia.⁵² As recruitment and retention becomes more costly, the

43 Ronald Lee and Andrew Mason, "What is the Demographic Dividend?" *Finance and Development* 43, 3 (2006), 16–17; David E. Bloom, David Canning, and J.P. Sevilla, *The Demographic Dividend: A New Perspective on the Economic Consequences of Population Change* (Santa Monica: RAND, 2002).

44 Daniel J. Smith, "Contradictions in Nigeria's Fertility Transition: The Burdens and Benefits of Having People," *Population and Development Review* 30, no. 2 (2004), 221–239.

45 John G. Bauer, "Demographic Change, Development, and the Economic Status of Women in East Asia," in *Population Change and Economic Development in East Asia: Challenges Met, Opportunities Seized*, ed. Andrew Mason, 359–384 (Stanford: Stanford University Press, 2001).

46 Nancy Birdsall, David Ross, and Richard Sabot, "Education, Growth and Inequality," in *Pathways to Growth: Comparing East Asia and Latin America*, ed. by Birdsall, Nancy and Frederick Jaspersen, 93–130 (Washington, DC: Inter-American Development Bank, 1998).

47 Nancy Birdsall, David Ross, and Richard Sabot, "Education, Growth and Inequality," in *Pathways to Growth: Comparing East Asia and Latin America*, ed. by Birdsall, Nancy and Frederick Jaspersen, 93–130 (Washington, DC: Inter-American Development Bank, 1998).

48 See *Global Trends 2030: Alternative Worlds*, National Intelligence Council, NIC2012-001, December 2012, available at <www.dni.gov/nic_2030>.

49 The Provisional Irish Republican Army, which was active in Northern Ireland from 1969 to 1997.

50 Jonathan Tonge, *Northern Ireland: Conflict and Change* (New York, Longman, 1996).

51 Anton Balasingham, *War and Peace: Armed Struggle and Peace Efforts of Liberation Tigers* (London: Fairmax, 2004).

Category	Median Age
■ Youthful	25.0 or younger
■ Intermediate	25.1 to 35
■ Mature	35.1 to 45.0
■ Post-mature	Greater than 45.0

Figure 3

Maps showing the global distribution of the four age-structural stages in 2010 (estimates). Median age data are from the UN Population Division's 2010 Revision, with the exception of the six states of the Gulf Cooperation Council. Median ages of the Council states are drawn from the U.S. Census Bureau's unpublished estimates and projections of citizen-resident populations



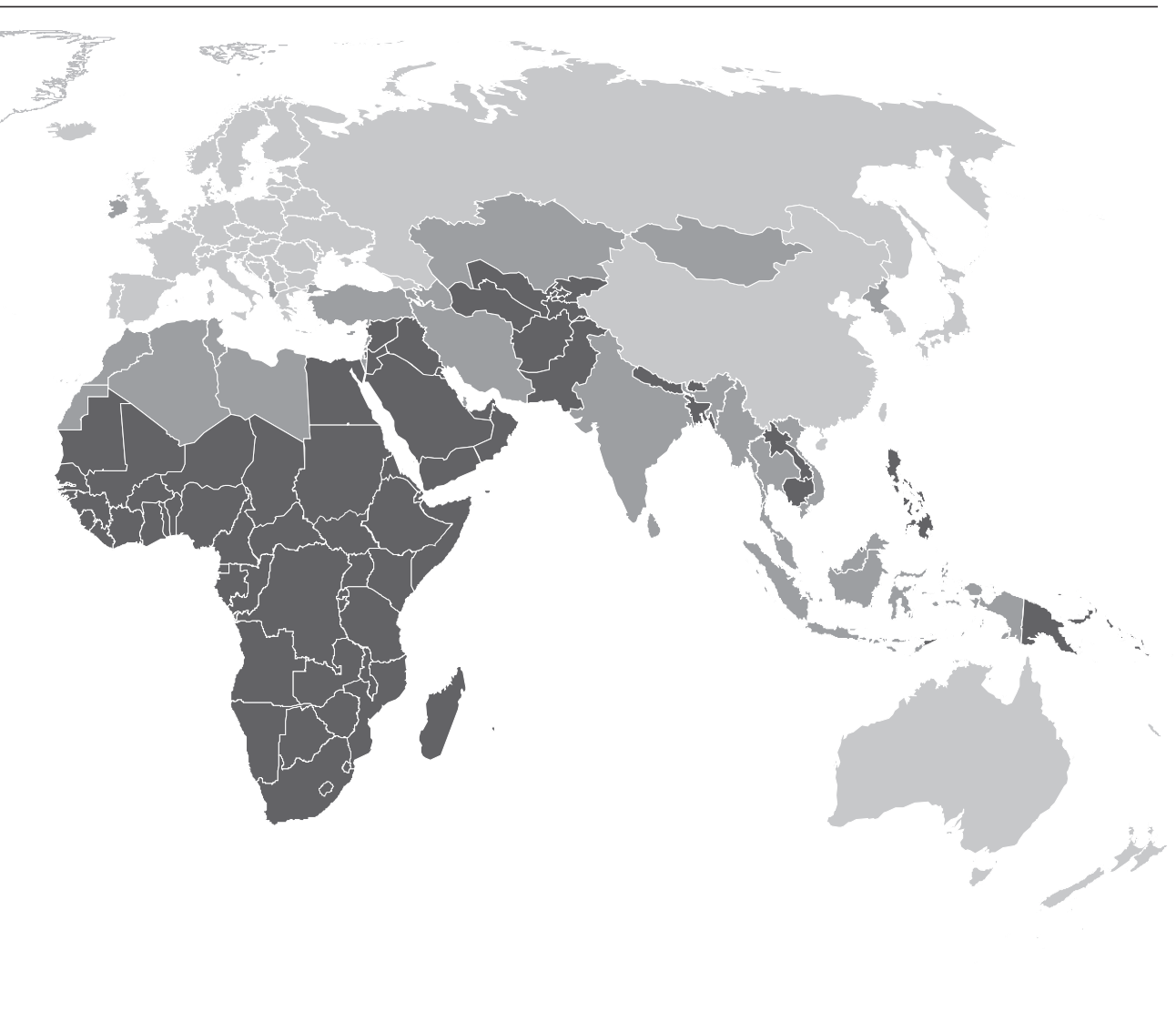
movement's smaller reintegration-resistant hard core tends to shift to lethally disruptive technologies to ply against the state, or drifts into the more lucrative sphere of organized crime.⁵³

Mature Age Structures

Invariably, with the passage of time, intermediate age structures transition to their mature stage (median age from 35 to 45 years). Most Western European

⁵² Jeremy McDermott, "Columbia's Rebels: A Fading Force?" *BBC News*, February 1, 2008, available at <<http://news.bbc.co.uk/go/pr/fr/-/2/hi/americas/7217817.stm>>

⁵³ One demographic note on intermediate age structures: they are inherently unstable. While keeping one of this categories age structures would be ideal, it is difficult to do. Given many developing states' propensity to get to replacement fertility levels and then continue lower, and the global trend toward longer lives, many countries that have enjoyed the economic benefits of intermediate age structures have done so for a rather brief period—27 years for Japan, 22 years for China, less than 20 years for both South Korea and Taiwan (Iran is currently projected to speed through in less than 20 years, as well).



states have dwelt in this demographic range for the past three decades. Although they have been able to achieve modest rates of economic growth and maintain political stability, they have also had to adjust to the fiscal liabilities of a steadily increasing proportion of seniors and a gradual decline in the size of the prime working-age population — those between ages 25 and 45; a sub-population that typically demonstrates the sharpest mental and physical skills.⁵⁴ Some European states have adjusted more successfully than others.

Recent research suggests that, for those states that invested intensely in human capital, moderate rates of savings and worker productivity growth are likely to linger on — what has been called a *second bonus*.⁵⁵ But as the working-

⁵⁴ Vegard Skirbekk, “Age and Productivity Potential: A New Approach Based on Ability Levels and Industry-Wide Task Demand,” *Population and Development Review* 34 supplemental (2008), 191–207.

Category	Median Age
■ Youthful	25.0 or younger
■ Intermediate	25.1 to 35
■ Mature	35.1 to 45.0
■ Post-mature <i>in 2030 map</i>	Greater than 45.0

Figure 4

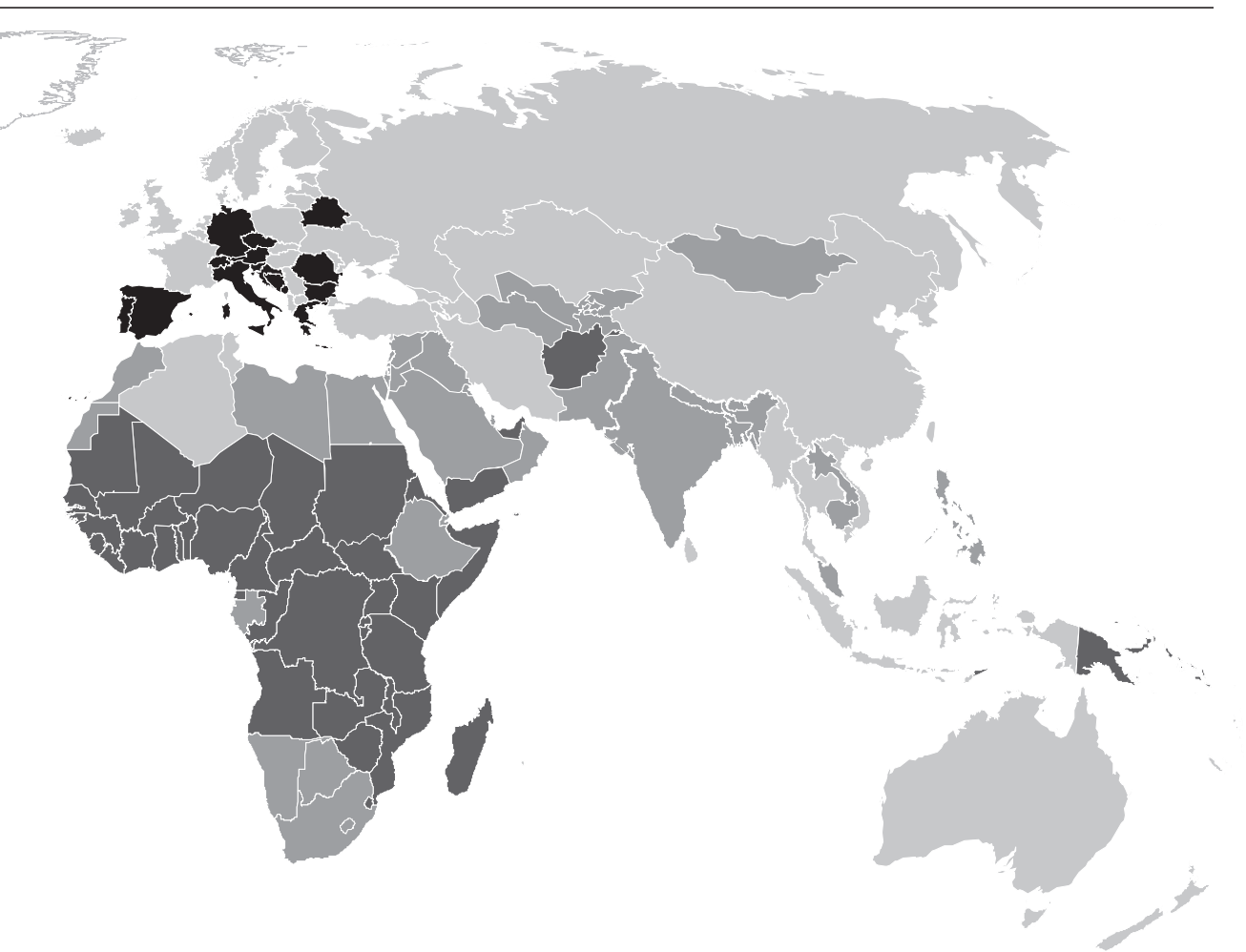
Maps showing the global distribution of the four age-structural stages in 2030 (projections). Median age data are from the UN Population Division's 2010 Revision, with the exception of the six states of the Gulf Cooperation Council. Median ages of the Council states are drawn from the U.S. Census Bureau's unpublished estimates and projections of citizen-resident populations



age population ages, and the prime-age population begins to decline, institutions are likely to assume more expansive roles in the economy, particularly self-financing institutions like those in the private sector.

Perceiving an approaching fiscal crunch as the rolls of retirees swell, age-structurally mature states are briskly turning to reforming under-funded state retirement systems, setting-back the retirement age and curbing no-longer-affordable patterns of state spending. In Western European capitals, political debates increasingly focus on “if and when” to accept immigrants, and whom to encourage. Both European and East Asian efforts to boost fertility from sub-replacement levels have recently picked up pace.

55 Ronald Lee and Andrew Mason. *Fertility, Human Capital, and Economic Growth over the Demographic Transition*, National Transfer Accounts Working Papers (Washington, DC: National Institutes of Health, 2010)



Post-Mature Age Structures

European and East Asian populations that have sustained exceptionally low levels of fertility (below 1.6 children per woman) are advancing rapidly toward the post-mature stage of the age-structural transition (median age greater than 45). This set of age structures is only now evolving and its implications, therefore, are not fully understood.⁵⁶ Analysts will soon shed their ignorance. As of 2012, Japan and Germany are probably past the 45-year mark. Italy, Portugal, and Austria could enter the post-mature category before 2020.

Most analysts who have studied the preparedness of European and East Asian systems for oncoming population aging foresee a future of fiscal, economic and political challenges for these states. The greatest threat is to pension and healthcare systems that are funded principally by current payroll contributions

⁵⁶ *World Population Prospects, the 2010 Revision* (New York: United Nations, 2011).

(pay-as-you-go). These are bound to become unviable as the proportion of seniors grows large and the workforce shifts to a smaller profile. Nonetheless, most European governments have been slow to organize and implement needed reforms, and their citizens have been reluctant to support them.⁵⁷

Geriatric healthcare costs appear to be the most difficult to control. As these costs rise, seniors' obligations will increasingly compete for scarce tax dollars with younger generations' demands for quality education and infrastructure. While it is not hard to foresee the day when, in some liberal democracies, organized retirees and workers hold their government's "feet to the fire" over broken pension and healthcare promises, the chances that aging will lead, on its own, to political turmoil seems slim. Several thoughtful analyses predict that, with aging, European powers will retreat from their international roles in development assistance and regional defense.⁵⁸

The most noteworthy characteristic of post-mature countries will likely be their demand for, and attractiveness to, labor migrants, and their chronic susceptibility to shifts in ethnic and religious composition. While demographic aging, by itself, produces only scant opportunities for divisive political entrepreneurs, many more possibilities abound when immigrant communities find it difficult to integrate or when they resist integration themselves, and when nativist groups erect social and economic barriers to integration. Intense nativist politics have already made significant inroads into the political spectrum of Western Europe's mature-category states, where ethno-religious residential segregation and cultural tensions have become, over only a few decades, established features of urban life.⁵⁹

Some difficult-to-answer questions are surfacing as European median ages approach and pass the entrance to post-maturity. While aging economies are assumed to suffer from a shortage of workers, just the opposite is happening: some aging European states are experiencing high rates of unemployment at all professional and technical levels. It just may be that the industrial era, during which an increasing or stable labor force was needed for economic prosperity, is slipping away. The coming reality is very different: state-subsidized salaries are increasingly deemed unaffordable; and workers, assisted by various microprocessor-controlled devices and supplied with an Internet-full of information, are expected to accomplish and produce more on their own — and without concomitant rewards. As their median age increases, advanced economies seemingly require fewer workers with more skills, and there is every reason to believe that this trend will continue.

57 Richard Jackson and Neil Howe, *The Graying of the Great Powers: Demography and Geopolitics in the 21st Century* (Washington, DC: Center for Strategic and International Studies, 2008).

58 Jack Goldstone "The New Population Bomb: the Four Megatrends That Will Shape the Global Future," *Foreign Affairs* 89, no. 1 (2010), 31–43; Mark L. Haas, "A Geriatric Peace? The Future of U.S. Power in a World of Aging Populations," *International Security* 32, no. 1 (2007), 112–147.

59 Eric Kaufmann, *Shall the Religious Inherit the Earth?* (London: Profile Books, 2010).

Ethno-Demographic Shifts

While there is no shortage of theories that evoke a demographic cause for political turmoil and state weakness, at this date only two have gathered a significant amount of supporting evidence: the case of youthful age structures, discussed earlier, and shifts in ethno-religious composition. Understanding where and why these ethno-religious shifts are occurring, and what impacts on state capacity they may generate will clearly be important to development planners and foresight researchers. Three models provide a theoretical backdrop for discussing this type of demographic contradiction in individual states:

Ethno-Religious Subpopulations

In countries with populations composed of socially and reproductively distinct ethno-religious subpopulations, decline from high to low levels of fertility and infant mortality most often occurs first among the most urbanized and educated ethnic groups, particularly among groups with rising incomes and where women exercise significant autonomy.⁶⁰ These staggered transitions have led to differences in fertility, producing diverging rates of population growth.

Women

In some parts of Europe and East Asia, changes in marital behaviors and the liberalization of women's roles have been associated with declines in fertility to levels that are now well below replacement.⁶¹ In states where the government and private sector encourage immigration to overcome perceived shortages in workers and reduce wage inflation, shifts in ethno-religious composition can be expected.⁶²

Dissonant Minorities

The *minority demographic security dilemma*⁶³ — a political hypothesis that is not inconsistent with either of the other two models — contends that the economic and social marginalization of dissonant minorities tends to promote social and reproductive segregation and delay the minority's transition to low fertility. This model predicts that when governments are unwilling, or unable, to break down barriers that obstruct the full economic and political participation of minorities, rapid minority population growth ratchets up majority-minority tensions and strengthens these barriers.

Some current state and regional cases of ongoing shifts in ethno-religious composition where USAID is active provide examples of several types of political

⁶⁰ Joseph Chamie, *Religion and Fertility: Arab Christian-Muslim Differentials* (Cambridge: Cambridge University Press, 1981).

⁶¹ Ron Lesthaeghe, "The Unfolding Story of the Second Demographic Transition," *Population and Development Review* 36, no. 2 (2010), 211–251.

⁶² David Coleman, "Projections of the Ethnic Minority Populations of the United Kingdom 2006–2056," *Population and Development Review* 36, no. 3 (2010), 441–486.

⁶³ Christian Leuprecht, "The Demographic Security Dilemma," *Yale Journal of International Affairs* 5, no. 2 (2010).

tensions that can be associated with this phenomenon. In the central Andes Region (Ecuador, Peru, Bolivia) and Paraguay, and the central isthmus of Central America (Guatemala, Honduras, Nicaragua), regions populated principally by Native Americans (*Indios*) remains at higher levels of fertility than more urbanized areas populated by the Euro-Latinos who founded these states, and have since dominated politics and the economy. Analysts should expect the growth and political mobilization of *Indios* communities, in these countries, to favor the election of leftist governments.

In Israel, the proportional size of the political center — a heterogeneous group of secular and traditionally religious Jews — is slowly being eroded by the growth of Israeli Arabs and Ultra-Orthodox Jews.⁶⁴ In the case of Israel's Ultra-Orthodox Jewish communities, clerical leaders pursue marginalization,⁶⁵ opting for social and locational segregation and a lower standard of living, which — when coupled with the circumscription of women's roles — has maintained a high fertility norm, above six children per woman.⁶⁶

Due to a delayed fertility decline, Lebanon's youthful rural Shiite population has eclipsed the lower-fertility Christians, Sunnis, and Druze.⁶⁷ While a drift from political extremism to moderation and integration should occur as the Shiite population matures, the pace of this almost inevitable political transition will be mediated by the funding of Hezbollah's foreign patrons, as well as the strength of Lebanon's economic recovery.

In India, where USAID is currently active, the population is better thought of as two populations of very different demographic conditions and trends. Each of the four Dravidian-language-speaking southern states is near or somewhat below replacement-level fertility, as are India's major urban centers. However, the slow fertility decline that occurred in the central northern states of Uttar Pradesh and Bihar has stalled near four children per woman.⁶⁸ The resultant growth should raise concerns about the scale of influx of poor and semi-literate migrants to India's cities and to South India. Not only are unskilled northerners a mismatch for the labor demands of the Indian industrial and service sectors, in large numbers they might also be unwelcome in parts of the southern states.

64 Richard P. Cincotta and Eric Kaufmann, *Uncompromising Demography in a Promised Land*, National Intelligence Council, NIC 2010-05, Washington, DC, 2010, available at <www.foreignpolicy.com/story/cms.php?story_id=4956>.

65 Noah J. Efron *Real Jews: Secular vs. Orthodox and the Struggle for Jewish Identity in Israel* (New York: Basic Books, 2003).

66 Sergio DellaPergola, "Jerusalem's Population, 1995–2020: Demography, Multiculturalism and Urban Policies," *European Journal of Population* 17, no. 2 (2001), 165–199; Eli Berman, "Sect, Subsidy, and Sacrifice: An Economist's View of Ultra-Orthodox Jews," (Jerusalem: Maurice Falk Institute for Economic Research in Israel, 1998).

67 Joseph Chamie, *Religion and Fertility: Arab Christian-Muslim Differentials* (Cambridge: Cambridge University Press, 1981).

68 Carl Haub and O. P. Sharma, *The Future Population of India: A Long-range Demographic View* (Washington, DC: Population Reference Bureau, 2007).

Beyond the Future

Are there roles for political demography and its forecasts in foreign policy and development planning? There should be. By positioning states according to their median age, and arranging them within the context of the four age-structural stages discussed earlier, policy analysts and foresight researchers generate images of the global distribution of favorable and unfavorable age structures. By using available demographic projections to peer one or two decades into the future, these analysts can obtain a “first approximation” of the identity of states in which the potential for political stability and developmental progress will arise, where that potential will remain strong, and where its strength will diminish. This system provides a much more nuanced and realistic categorization of states and their pace of progress than the increasingly misleading dichotomy of “developed countries” landscape versus “developing countries” that pervades the current discussion. This now-dated nomenclature remains anchored to per-capita income levels of countries during the decades following the close of World War II. USAID and its development partners are well advised to place greater emphasis on age-related structures.

The underlying thesis of current demographic research — that “some age-structural conditions are much less conducive to building, maintaining and exercising state capacity than are others” — has major implications for how development planners and foreign affairs policymakers go about their business. Yet, because university curricula in political science, international relations and international development rarely require a course in demography, most students will graduate without understanding the degree to which the age-structural transition, family size, and fertility decline bear upon the focus of their studies. Unless this omission is corrected, America’s next generation of foreign affairs analysts and development practitioners will be deprived of a window through which they might better understand the present behavior of states, and glimpse critical features of the global future.

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Science and Technology

Science and technology can empower countries and their citizens, and can transform society.

Science and technology (S&T) has facilitated incredible advances in international development such as oral rehydration therapy, wind and solar power, mobile banking, and geographic information systems. In short, S&T has improved the lives of millions and made development initiatives more efficient and cost effective. The USAID Futures Symposium panels on “*Science and Technology*” brought together a number of experts to discuss important topics such as the explosion of information communications technologies, proliferation and access to data, and the “democratization” of science and technology.

Panelists noted the challenge of mapping future S&T trends is, in large part, due to a surge in innovation targeted at the developing world combined with unprecedented rapid change. In 2002, for example, there were just two countries in the world with mobile cellular penetration over 100 percent. By 2010, almost 100 countries had mobile cellular penetration over 100 percent and 17 countries had penetration over 150 percent. Rapid developments such as these make futures analysis even more essential. Panelists stressed the importance of thinking ahead to stimulate future innovations. Speakers highlighted the explo-

sion of information communications technology (ICT). ICT is currently helping practitioners address some of the most compelling development challenges throughout the world. It is widely recognized that Facebook played a game-changing role during the Arab Spring, particularly in orchestrating the revolution in Tunisia. It is estimated that more than three quarters of the world's population has access to mobile phones; nearly 5 billion of the 6 billion mobile subscriptions belong to individuals in developing countries. Mobile devices, including short messaging services, otherwise known as SMS, and applications are being used to improve access to health care, to facilitate making cash payments (limiting corruption), to expedite humanitarian assistance and disaster relief, to improve literacy, and to assist the monitoring and evaluation of development projects.

Conversations about the ICT revolution sparked a second set of discussions about data

proliferation. With increasingly varied and numerous ways in which to collect data, we now have access to more information from multiple sources than ever before. The challenge is how to use this data to understand the development challenges, design on-target programs, and monitor progress. How do we analyze all of this data once it is collected? For example, Frontline SMS, an open source platform that helps non-governmental organizations lower barriers to positive social change, receives 192,000 texts per second. These texts constitute an enormous amount of potentially useful information. However, these messages are neither searchable nor stored in an accessible way. Indonesia represents the largest national population using Twitter. People tweet about looking for work, migrating, getting sick, and rice prices. This information, if harnessed, could be used to map development-related trends and address future challenges.

The importance of building

new partnerships was also highlighted. It was noted that two-way communication between institutions and individuals will be vital if science and technology is to truly impact development. The World Bank, for example, is becoming a much more open institution, and in 2012, threw an “Apps for Climate” competition and awarded \$55,000 to the finalists. USAID and other development organizations are creating competitions to pull in new actors such as universities, and the private sector, and intelligent individuals.

Finally, there was considerable discussion about the benefits of the “democratization” of science and technology. With the spread of the mobile phone and broadband, new inventions can come from anyone, anywhere in the world. This individual empowerment has enormous potential for good. The developed world must act as a catalyst rather than just a disseminator of technology. Countries should be empowered to tackle development issues

independently but cooperatively; the transfer of knowledge and education is more important than ever.

Technological Change and Sustainable Development

Linton Wells highlights the importance of the fast-changing trends in biotechnology, robotics, information sciences, nano-technology, and energy that are re-shaping tools for development success.

Panels on the topic of science and technology at the Symposium on Future Development Challenges focused on next generation technological innovations and their potential to increase mobilization, globalization and connectivity. Some of these innovations, such as improved tools for irrigation and food productivity, and innovations for better disease diagnosis, prevention, and treatment, are destined to become game-changers for development. At the same time, it was noted that the evolution and field application of other technologies, like nanotechnology, were promising, but much less certain to realize positive development impacts, at least in the near term. The most highly discussed topic regarding science and technology innovations was unsurprisingly the unprecedented growth of information and communications technology (ICT).⁶⁹ The potential of hand-held devices to improve the quality of life was emphasized frequently. Mobile devices, for example, can increase access to modern health care, safely move money digitally, and foster learning by increasing literacy.

There is no doubt that technology is changing the world in which we live faster than in any other period in human history. Technological advancements affect every aspect of society. The proliferation of science and technology (S&T) is helping to create tools that are cheap, widely available, and easy to use. The individuals, corporations, and governments that best make use of these new

⁶⁹ Information Communication Technology (ICT) is the preferred term, as opposed to Information Technology (IT), because it includes broadcast radio, which serves as a principle means of mass communications in many parts of the developing world.

technologies will have the opportunity to determine tomorrow's economic winners and losers, reshape political power structures and profoundly change the developing world. S&T will revolutionize the way the next generation of children learn, how families receive health benefits, and the quality and quantity of the water they drink and the food they consume. Aid organizations that fail to grasp the revolutionary power of S&T will be left in the dust.

Fostering the development of cutting edge technology is in the vital interest of the American people. The Obama Administration has paid a great deal of attention to science and technology, understanding the important role it plays in advancing our national security interests and helping to stimulate innovation and economic growth. Viewed in this light, the challenge that policymakers face over the next two decades is how to develop a strategy that simultaneously maintains the United States' technological edge while detecting emerging technologies and discovering new ways to employ these technologies to improve the lives and livelihoods of those in the developing world. Before a workable strategy can be developed, however, it is necessary to understand the different types of technological developments that are underway.

Parallel Revolutions in Science and Technology

Several parallel scientific and technological revolutions are in motion. The information revolution is obvious. ICT has not only increased the speed with which we communicate, it also has fundamentally altered the way in which we communicate. ICT and cellphone-based services have helped to improve everything from education to maternal care, particularly in the most remote areas of the world. The 2010 Haiti earthquake, 2011 Tōhoku earthquake and tsunami, and 2012 Hurricane Sandy show how advancements in ICT can help to save lives and make a difference on the ground.⁷⁰ Likewise, when policymakers and practitioners look at the future of aid and development, ICT is an area commonly cited as a catalyst to deliver and administer assistance more effectively and efficiently. Crowd-sourced⁷¹ information increasingly is being used in humanitarian assistance and disaster relief for everything from damage assessments to locating unexploded ordnance and linking citizens to first responders. These examples highlight the value of having educated users who

⁷⁰ John Crowley and Jennifer Chan, *Disaster Relief 2.0: The Future of Information Sharing in Humanitarian Emergencies* (Washington, DC and Berkshire, UK: UN Foundation and Vodafone Foundation Technology Partnership, 2011), available at <http://issuu.com/unfoundation/docs/disaster_relief20_report>; Lois Appleby, *Connecting the Last Mile: The Role of Communications in the Great East Japan Earthquake* (London: Internews Europe, undated), available at <www.internews.eu/News/Japanreport/>; and "GIS Technology Saves Lives in Hurricane Sandy," *Information Technology Blog*, American Sentinel University, October 29, 2012, available at <www.americansentinel.edu/blog/2012/10/29/gis-technology-critical-in-hurricane-sandy/>.

⁷¹ Crowdsourcing, here, is shorthand for a variety of open-source, social-media-enabled, approaches to take advantage of the collective wisdom of large groups. Technologies used range from blogging to SMS text messaging, from social media platforms (Twitter, Facebook, hi5, others) to the integration of open source data onto satellite base maps.

understand how to use technology in new ways to solve problems.

Yet, information technology is just one part of a larger technological transformation occurring throughout the world. Collectively, much of the change will be driven by a group of technologies known as BRINE: Biotechnology, Robotics and human performance enhancements, Information (as referenced above) and cognitive science, Nanotechnology and new materials, and Energy.⁷² These technologies have the potential to dramatically change the way we live and how long we live — in the United States and around the world. BRINE concepts, outputs and interactions will also have a profound impact on the global development sphere where USAID works. Each of these revolutions warrants a closer look:

- *Biotechnology* is changing even faster than information technology in many respects. Synthetic biology offers extraordinary promise, peril and ethical issues, and biomedical engineering majors now command the highest starting salaries of recent college graduates.
- *Robotics* brings increasingly capable unmanned military vehicles, exceptional tools for scientific exploration and new approaches to manufacturing. However as robots become more independent in action, this also poses conceptual, operational and ethical dilemmas.
- *Information* through neurocognitive research is opening new insights into how we think, how people interact and how to treat brain injuries.
- The very small products of *nanotechnology* research are finding their way into everything from new types of materials to cancer treatments to energy storage.
- *Energy* itself is another revolution. The search for alternatives to hydrocarbons, learning to use the fuels we have better, and understanding related environmental impacts shape technical, economic and political agendas around the world.

It may be possible to expand BRINE by adding developing technologies such as additive manufacturing (also known as 3D printing) which allows for the creation of complex three-dimensional objects by laying down successive layers of material in a printing device based on a Computer-Aided Design. This technology will likely have a huge impact on international logistics and supply chains, moving traditional manufacturing from industrial centers to more localized environments.⁷³ This will have implications for development planners

72 See Linton Wells, II, "Tech Changes Affect U.S. Security," *Defense News*, January 22, 2012, available at <www.defensenews.com/article/20120122/DEFBEAT05/301220002/Tech-Changes-Affect-U-S-Security>.

73 See Neyla Arnas, Tom Campbell, and Connor M. McNulty, *Toward the Printed World: Additive Manufacturing and Implications for National Security*, Defense Horizons 73 (Washington, DC: NDU Press, September 2012).

as urbanization, smart cities, innovation hubs and new infrastructure become even hotter topics in development thinking and program implementation. Other revolutions may also arise such as discoveries in dark matter or dark energy, but the BRINE technologies are likely to stimulate discovery and spur innovation globally over the course of the next 20 years.

The Strategic Challenge of Technological Development

The velocity of change is also an important factor to consider. Technology is moving at a much faster pace than many realize. By some measures, the number of transistors on a computer chip is doubling about every 18 months (one formulation of the famous “Moore’s Law”). This means that in the eight years until 2020, this reflection of computing power alone will increase by 4,000 to 5,000 percent. Speed, mobility, commoditization, big data, and the cloud will drive the future ICT environment.⁷⁴ Biotechnology is changing even faster than information technology in many respects. Genes can be sequenced in a fraction of the time and cost of even a few years ago. Their influences will continue to grow, and the opportunities and risks they provide need to be addressed as strategic issues. Linear projections based on current trends cannot work in this world.⁷⁵

The variety of scientific and technological revolutions, and to some extent the way they are distributed geographically (geotechnology), are also changing. Tools for international aid and development will be increasingly distributed. For instance, three of the 10 fastest super computers are located in the United States, but the lead has changed several times in the past two years.⁷⁶ In the past, most of the world’s centers for innovation were located in the United States. The fact that Silicon Valley was physically located in California gave the United States a competitive advantage, allowing for closer collaboration among developers, innovators, and educators. However, the future centers of technological development are likely to be located in many nations across the developed and developing world. As more robust science and technology capabilities develop globally, the United States will no longer be the preeminent driver of innovation.⁷⁷ Research in other nations, such as the BRIC (Brazil, Russia, India,

74 Linton Wells, II. *Managing Network Risk in Times of Rapid Change: Implications for DOD IT Investments and Enterprise Architectures*, unpublished article.

75 See Linton Wells, II. “Tech Changes Affect U.S. Security,” *Defense News*, January 22, 2012, available at <www.defensenews.com/article/20120122/DEFFEAT05/301220002/Tech-Changes-Affect-U-S-Security>.

76 “Nuclear weapons supercomputer reclaims world speed record for US,” *The Daily Telegraph*, June 18, 2012, available at <www.telegraph.co.uk/technology/9338651/Nuclear-weapons-supercomputer-reclaims-world-speed-record-for-US.html>.

77 Tim Coffey and Steven Ramberg, *Globalization of S&T: Key Challenges Facing DOD*, Defense & Technology Paper 91 (Washington, DC: Center for Technology and National Security Policy, 2012), available at <www.ndu.edu/CTNSP/docUploaded/DTP91%20Globalization%20of%20SandT.pdf>.

China) countries and Singapore, which is actively seeking to become a world-class biotechnology center through its international research and development facility Biopolis,⁷⁸ will produce world-class results.

The Humanitarian and the Machine: Leveraging Technology is as Important as its Development

While BRINE technologies can have a major impact on societies, technology alone is not enough. Consider the case of developing countries, humanitarian aid, and disaster relief. Given the number of stakeholders who have equities in the deliverance of aid, building social networks and developing trust with local populations is critical. There have been countless examples of failed development projects due to the fact that the local population could not sustain the technology being used. Solutions need to be designed from the bottom-up focusing on the needs of the local population rather than the interests of aid providers.⁷⁹ Unless local populations in developing and emerging countries can sustain technologies in their own worlds and with their own resources, these countries will only continue to be dependent on outside development assistance.

The aid and development landscape is changing. In order to utilize technologies more efficiently, we have to develop robust networks in advance. No one organization has a monopoly on good ideas. Increased collaboration and shared situational awareness among disparate stakeholders can help improve readiness for, and responses to natural disasters, instabilities, insurgencies, food crises, and other emergencies. An example of one such approach is the Transformative Innovation for Development and Emergency Support (TIDES) approach,⁸⁰ a U.S. Department of Defense research project at the National Defense University. TIDES has developed an integrated, whole-of-government approach based on low-cost, crosscutting solutions. The project supports four Defense Department mission areas: steady state initiatives to shape security environments and engage with partners; post-conflict stabilization and reconstruction; Foreign Humanitarian Assistance/Disaster Relief (FHA/DR); and Defense Support of Civil Authorities (DSCA) at home. One of TIDES' most valuable assets is its ability to engage talent and tap into innovation through the global STAR-TIDES network.⁸¹ The project encourages public-private, whole-of-government and transnational approaches for an unpredictable

⁷⁸ For more information on Biopolis, see <<http://www.biopolis.es/en/inicio/index.php>>.

⁷⁹ Linton Wells II, Walker Hardy, Vinay Gupta, Daniel Noon, *STAR-TIDES and Starfish Networks: Sharing Sustainable Solutions for Populations under Stress*, Defense Horizons 70 (Washington, DC: NDU Press, available at <www.ndu.edu/CTNSP/docUploaded/DH%2070.pdf>).

⁸⁰ This research project is coordinated at the Center for Technology and National Security Policy (CTNSP) at the National Defense University (NDU), which is part of the Department of Defense. See the homepage, available at <www.star-tides.net>.

⁸¹ TIDES is part of a broader network called STAR (Sharing to Accelerate Research). The STAR-TIDES network is a global community consisting of over 1500 members.

and complex world. For example, after the 2010 Haitian earthquake, the project helped catalyze cooperation and information sharing between government agencies and civilian technologists.

In addition to building networks it is also important to understand how to convert policy and doctrine into effective field operating procedures. This is especially important for aid development programs and projects. It is not enough to have high-level policy doctrine. People must understand what to do in the field in order to implement activities effectively. It is also important to understand the legal and regulatory constraints that surround operations. Different scenarios will require different resourcing approaches, ranging from immediate crisis response to long-term capacity building, sustainability, and resilience. The average stay in a refugee camp is over seven years, which requires a different set of solutions than immediate responses. Finally, lessons are never learned until behaviors change. Training, exercises, and education are critical to changing behaviors.

Organizational culture can be an impediment that creates resistance to change, causing groups to shun new ideas and work less productively. Culture is a delicate and important aspect of every organization, academic institution and local population. One needs to look no farther than the military departments to understand the importance of culture in an organization's daily life. The same is true for development donors like the U.S. Agency for International Development (USAID) and other aid players along with the private sector. The innovative use of new technologies may clash with existing cultures. However, the lack of attention to culture will likely weaken any project's effectiveness. The challenge will be convincing relevant organizations and individuals to adopt new methods within their cultural norms and learning how to change cultures at an appropriate pace to think differently. This will require new approaches to training and education as well as increased collaboration with various stakeholders.

The Basis for Future Strategy

In an age of fiscal austerity and declining budgets, development assistance will play an important role in helping to advance American interests abroad. From challenge competitions, such as USAID's Grand Challenges for Development initiative⁸² to the Presidential Policy Directive (PPD) on Global Development, the Obama Administration has done a great deal to elevate the role of development as "a core pillar of American diplomacy."⁸³ Similarly, the Quadrennial Diplomacy and Development Review (QDDR) is a first attempt at helping the U.S. Department of State and USAID look beyond today's problems

⁸² See *Grand Challenges for Development*, Homepage, available at <www.usaid.gov/grandchallenges>.

⁸³ On September 22, 2010, President Barack Obama signed a Presidential Policy Directive on Global Development to elevate the role of development as a core pillar of American power.

to achieve future aid and development goals.⁸⁴ While policymakers have started to advocate strategies that focus more on solving long-term development challenges, strategic guidance is needed to help agencies make sense of the parallel revolutions taking place and their impact on the global development sphere.

Our investment in and understanding of key technological opportunities and risks should be as much a part of global strategy debates as geopolitics, demographics, economics, and the nature of conflict. These effects deserve the attention of policymakers, ambassadors, commanders, and USAID Administrators and Agency mission directors, not just specialists or technologists. Information age technologies need to be fully integrated into policy, doctrine and operating procedures. Just as in business, new technologies and better coordination of efforts helps to maximize efficiency. A nation that has taken this type of approach is Singapore. A closer examination of the methods Singapore is employing is instructive to understand potential solutions.

Singapore has long been focused on achieving a “Whole-of-government” and “Whole-of-society” approach, involving the deputy secretary-equivalents from across the government to discuss emerging issues and to share experiences on foresight initiatives.⁸⁵ This type of system allows leaders to think strategically and to learn from each other instead of episodic engagements like quadrennial reviews. Organizations such as the National Intelligence Council (NIC) and the Defense Science Board also are looking at technology trends in detail, but coalitions across all sectors of government must be built. USAID and the NIC, for example, are increasingly cooperating to better understand emerging development-related trends.

Translating Singapore’s “Whole-of-government” and “Whole-of-society” approach into practice means that the United States should develop connections at all levels, between government officials, international organizations, academics and local actors *before* events occur instead of on an *ad hoc* basis. Information sharing can help identify vulnerabilities, devise better defenses, establish best practices, and detect and mitigate future attacks. The aid landscape will be filled with new players, each with different priorities, methods, and perspectives for engagement with the local population. In the years ahead, civil-military coordination will be critical in helping to solve future development challenges. Sustained engagement, agility, commitment and coordination among different parties is essential to achieve sustainable and lasting aid and development goals.

84 See Richard L. Kugler, *New Directions in U.S. National Security, Strategy, Defense Plans, and Diplomacy* (Washington, DC: NDU Press, 2011), available at <www.ndu.edu/CTNSP/docUploaded/New%20Directions.pdf>.

85 S. Ramesh, “Singapore forms strategic futures network to discuss emerging risks,” *Singapore News*, September 13, 2010, available at <www.channelnewsasia.com/stories/singaporelocalnews/view/1080932/1/.html>.

Conclusion

While advancements in science and technology will continue to have a profound impact on the global development community, the future will be filled with complexity, uncertainty and interdependency. S&T must be integrated into policy and planning to help set national priorities and shape future development initiatives. We must design solutions that are affordable and sustainable as priorities shift and we face a more austere fiscal environment. New forms of public-private cooperation will be essential to ensure long-term sustainability. The QDDR emphasizes the need to build global coalitions to address global problems.⁸⁶ The government cannot keep up with the scale and velocity of commercial innovation. Entrepreneurs need to be encouraged to cooperate with one another to ensure the success of projects and sustain local capacity.

The challenge ahead for policymakers is to look beyond today's issues to understand how the converging revolutions in S&T will intersect with future development efforts. Agility and resilience must be factored into the planning process to prepare for future shocks and allow for a faster recovery. Preexisting networks that are ready to be deployed at a moment's notice should be the hallmark of future technology strategies. Building these human connections prior to an emergency will only help to strengthen the United States' competitive edge and save lives. Prospects for success in diverse missions from disaster response to building partnership capacity to stability operations can be increased if authorities treat science and technology as critical infrastructures and essential services.

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⁸⁶ *The First Quadrennial Diplomacy and Development Review (QDDR): Leading Through Civilian Power* (Washington, DC: Department of State, September 2010), 23, available at <www.state.gov/s/dmr/qddr/index.htm>.

Future Trends: Science, Technology, and Engineering for Development

Andrew Reynolds provides insights into how the advancement of science, technology, and engineering are radically re-shaping the development assistance landscape.

It was no surprise that there was standing-room-only during the three Science and Technology (S&T) panels at the U.S. Agency for International Development's (USAID's) Futures Symposium. The ever-increasing number of headlines, blogs, YouTube videos, and Tweets that flooded the airwaves and broadband this year about game-changing S&T tools poised to revolutionize the impact, sustainability, and scale of development assistance was unheralded. In reality, this explosion in social networking represents "the new normal." These tools ranged widely from the use of "concrete tents" for humanitarian assistance and disaster relief to the first-time availability of crop insurance by private companies targeted to small-scale farmers. Localized data from satellites combined with computerized on-ground sensors grabbed headlines as did exponential surges in cell phone banking, money transfers and microcredit schemes. Cheaper, faster, and more accurate medical diagnostics have been made possible by hand held devices. By all accounts, this was the year for S&T development breakthroughs.

This chapter documents major themes that arose during the Science and Technology panel of the USAID Symposium's Vision 2025 Session.⁸⁷ The

⁸⁷ At the USAID Symposium on Future Development Challenges, the thematic panels were organized into three sessions: Evolutions, Revolutions, and Vision 2025. More on these sessions can be found in the introduction to this book. While the Evolutions Session examined current trends and recognizable patterns, the Revolutions Session considered future possibilities and potential game-changing events. The Vision 2025 Session built from the first two sessions, and combined these ideas and more to examine what development might look like in 2025.

speakers at this third session expanded on ideas that arose during the Evolutions and Revolutions Sessions to examine how S&T will change the global “aidscape” by 2025. With the rapid expansion of global connectivity and the resulting increased human empowerment potential, how must actors in the development sphere adapt in order to be relevant and effective in the future? Panelists and participants addressed the relevance of futures analysis and capacity building for USAID as well as for other donor organizations.

Previous U.S. Government Initiatives

The Obama Administration’s National Security Strategy and the Quadrennial Diplomacy and Development Review (QDDR) provides deeper context for the discussion, as does the U.S. State Department and USAID joint budget and resource planning process.⁸⁸ In these strategic planning exercises, several themes are emphasized:

- Transnational issues and global challenges require interdisciplinary approaches and solutions for successful U.S. diplomacy and development policies and programs;
- Science, technology, engineering and innovation are seminal for addressing these challenges and empowering the related policies and programs; and,
- Public-private partnerships are also critical to success for development programs, especially in a period of acute budget constraints.

Strategic forecasts made over the past decade, such as those provided by State/USAID Project Horizon 2025 and various editions of the National Intelligence Council Global Trends Reports, reached similar conclusions about major trends that will impact the future.⁸⁹ Several trends worth noting include:

- Science, technology, and engineering will be indispensable to address grand challenges, but will face economic, social and ethical boundaries and limits;
- Growing population and increased human needs will collide with resource constraints;
- The assault on the global commons could become more intractable as

⁸⁸ *National Security Strategy* (Washington, DC: The White House, May 2010), available at <www.whitehouse.gov/sites/default/files/rss_viewer/national_security_strategy.pdf>; *The First Quadrennial Diplomacy and Development Review (QDDR): Leading Through Civilian Power* (Washington, DC: Department of State, September 2010), available at <www.state.gov/s/dmr/qddr/index.htm>.

⁸⁹ *Project Horizon Progress Report* (Washington, DC: Interagency Strategic Planning Coordinating Conference, 2006); *Global Trends 2030: Alternative Worlds*, National Intelligence Council, NIC2012-001, December 2012, available at <www.dni.gov/nic_2030>.

national and international institutions may not be capable of providing adequate leadership and governance; and,

- The information revolution is empowering individuals and non-state actors in unforeseen and unprecedented ways, challenging the status quo and traditional institutions and spurring a new generation of special interests and entrepreneurship.

In the strategic forecasts of Project Horizon 2025 and Global Trends 2030, science and technology were cited as critical drivers for future prosperity and economic development, potentially disruptive in both positive and negative ways and seminal for addressing global challenges in food security, human health, management of water and other natural resources, energy, environmental and biodiversity conservation, and climate change.

Practitioner Viewpoints

During the symposium panel, a number of speakers made a strong case for the notion that S&T will have irreversible impacts on the future of development. Monumental gains in communication assets and the related use of social media will lead to the gradual erosion of formal institutions and the rise of individual data generators and consumers. While the World Bank and other institutions like USAID have been transforming to embrace new ideas like open data, prizes, and competitions, their leadership knows that over time, these and other “brick and mortar” institutions must adapt and will likely become another powerful online node in the global development space.

Traditional development institutions like USAID are seeking to break their insularity and listen to the “outside world” to foster more discourse, dialogue and improve information exchanges about development needs — especially those that arise from people best placed in the developing world to understand them. These institutions will retain their capacity to advocate and lobby governments and other stakeholders to further open such channels. In short, the effectiveness of traditional development institutions in the new “aidscape” will be based on how well they generate and foster genuine dialogue.

Thirty-five billion devices like PCs, mobile phones and iPads in the world represent a huge, “two-way radio capability” that can be leveraged to hear the voices of people using the cell phone as a microphone to voice their development needs and aspirations. The availability of over 50 billion devices, predicted by 2020, will make this voice ubiquitous.⁹⁰

While there was general consensus on the ability to use futures analysis for development, some voiced skepticism and called for caution. One panelist

90 Network to CISCO predictions available at <<http://www.networkworld.com/news/2011/071511-cisco-futurist.html>>

suggested that experts are no better than “dart-throwing monkeys” at predicting the future. Policymakers, he argued, should focus on identifying and achieving ambitious and achievable goals, rather than attempting to predict solutions.

During the session, panelists and participants alike discussed setting goals for policymakers. A number of thought-provoking *future-focused* questions emerged. For example, is it possible to:

- Move beyond carbon-neutral energy sources to scalable high capacity energy ones?
- Increase the utilization of existing vaccines and develop new ones?
- Build new formats for behavior change communication to propel public health information?
- Boost agricultural productivity gains while facing reductions in the arable land needed to feed more people?
- Speed development of mobile devices to provide information needed to answer top priority questions?
- Roll out more USAID programs based on an “experiment, validate, and scale” approach?
- Envision new tools such as grand challenges, open innovation platforms to create demand for new products and services?
- Strengthen partnerships between government and the private sector, NGOs, and individuals to better design, launch and sustain collaborative efforts?

There was lively discussion at the session on the recent launch of the United Nations Global Pulse research and development laboratory.⁹¹ This, and others labs like it, have the capacity to capture real-time data for a more agile approach to development practice involving big data and social media as a jumping off point. It was said that Global Pulse arose due to the fact that current economic responses and development tools are seriously out of date. In addition, traditional surveys and national statistics take too long to process and evaluate, and are costly. This slowness and high unit cost inhibits quick responses in determining development success or failure. The Millennium Development Goals, for example, will not provide measurable results until 2019 according to Global Pulse. Moreover, these experts claim that close to 90 percent of the world’s existing data was created in last two years; so, unless we use new tools, development practitioners will forever be behind the curve.

⁹¹ To learn more about the United Nations’ Global Pulse lab, see their Homepage, available at <www.unglobalpulse.org/>.

It was emphasized repeatedly that social networking represents a great opportunity to help address this data deluge. Indonesia, for example, a current recipient of USAID development assistance, has a large number of Twitter users. In fact, Jakarta is the world's most active Twitter city.⁹² Citizens tweet about looking for employment and share information about a variety of topics such as migration, health services, and prices for rice and other commodities. Much of this information is public and can be useful as metrics for development programs. Retrospective analyses are being conducted on mobile calling patterns from 2008, before the global economic crisis hit, to discern trends in health and economic issues and possible correlations or patterns that could have been used predictively in 2009–2010.

Private data networks and mobile calling trends can also provide “digital smoke signals” to identify issues of consumption behavior and well-being throughout the developing world. While the use of aggregated data can be made anonymous to protect personal security and privacy, more effort needs to be put into working with private industry to foster greater “data philanthropy.” Private industry has begun to realize that putting data into a “commons” to provide information for examination of possible solutions is a solid business strategy and will protect future economic investments. Session participants also pointed out that social media may be instrumental in helping development practitioners know whether or not a project worked immediately after its implementation and down the road following completion. The impact of development assistance will be more dynamic as more aid recipients provide timely feedback.

Other practitioner points that arose during the session focused on the rise and changing nature of the aid individual or client, who both provide solutions and receive benefits in the new world of development assistance. The future role of development agencies like USAID and the World Bank will be to serve as connectors to solutions, not just providers of experts as in the past. Open innovation will be imperative, no longer just an option. The development field, it was generally agreed, must overcome the collective challenge to look at issues collectively rather than in isolation and to seek cross-cutting solutions for development problems. These new approaches and analytic potentials, once adopted, will help harness innovation for development and lead to breakthroughs in low-cost solar energy use, cheaper housing, and more drinkable water.

Discussion about the role of universities also drew considerable attention during the symposium. For example, it was noted that universities are demonstrating an increasing interest in development studies, both in undergraduate and graduate levels and, in particular, in the area of global health. Harvard University has implemented a cross-cutting program that strives to

92 “Jakarta is ‘world’s most active Twitter city,’” *Al Jazeera*, August 1, 2012, available at <www.aljazeera.com/news/asia-pacific/2012/08/201281141334716.html>.

tackle the challenge of malaria.⁹³ The private sector has also witnessed an increased level of interest and participation in development. Many exported goods are sold in the developing world and stable societies combined with healthier people means a bigger potential market for needed goods and services.

There was a general consensus among participants that there was an impending shift in solution providers as fewer government entities, and more individuals and communities, participate in the 21st century development space. Accelerating growth in information sharing via Internet-based platforms will yield better access to resources all around the world.

Four Thematic Highlights and Conclusions

Traditional stakeholders and institutions like USAID will still be vital in the future development space. At the same time, individuals are becoming more critical, empowered by modern information and communication technologies, social networking and open innovation platforms. Traditional assistance organizations and facilitators need to become more attuned to local stakeholder's needs to identify the best solutions for local problems. With those points as context, four main conclusions can be drawn from the session about the future role S&T and engineering can play in development. These are briefly described as follows:

- 1) Traditional and changing institutional cultures and codes of conduct for development;
- 2) The role of universities in development;
- 3) The imperative for institutional cultural change to embrace development in the new, 21st century paradigm and to serve as connectors for and between individuals and all stakeholders;
- 4) The importance of metrics and new administrative approaches and funding modalities for development.

Institutional Culture and Codes of Conduct: the World Bank and the United Nations Must Change

On organizational culture, it was asked rhetorically if the World Bank is a “bank with brains or a university with money?” In response, it was stated that “learning and lending are connected and the job now is to connect practitioners.” The World Bank Institute is an arm for capacity building, but the World Bank as a

93 *Harvard Malaria Initiative*, Harvard School of Public Health, Homepage, available at <www.hsph.harvard.edu/research/hmi/>.

whole has a limited role as a “global university” and must serve more as a facilitator for information exchanges between countries about best practices in training, content and other capacity-building endeavors. Culturally, the World Bank is still structured around old paradigms, and according to some, reform has been uneven at best. It has been difficult, for example, for the World Bank to break away from the traditional approach of providing “first world solutions” for “third world problems.” However, progress is being made to cultivate an open innovation team approach to shift from closed development (i.e., North/South knowledge exchange and work with governments) to open development (such as multi-modes of learning where lending is but one tool utilized with many participants). This type of institutional culture reform is also needed in other international development banks.

The same challenges face U.N. organizations. It is now widely recognized that institutional cultural changes are required to meet future needs, and organizations must either adapt or perish. Bureaucracies have a tendency to slow down decisions and punish mistakes through commission, yet they do not punish inaction or traditional habits of omission. In the brave, new world of empowered individuals, open sources and social networking, bureaucracies are being held more accountable and must react, for example, to negative Tweets and other social network observations about the organization. In addition, it is the people at the ground level in the bureaucratic trenches that are often the best representatives of their organizations, not the senior officials. These front line “troops” are in better touch with opinion makers who Tweet about their discussions, thus creating a new environment of blended private-public information generation and sharing.

Notwithstanding these new alignments, governments will always have a seminal role to play in development. Practically speaking, the U.N. “stakeholders” are 193 sovereign nations that will continue to establish and regulate standards for commodities, health products and technologies, and will provide training and education resources for citizens. But it is clear that governments must adapt to the new world of social networking and individual empowerment, and they must engage more deeply and transparently with their people and recognize that citizens are becoming more educated and sophisticated in all facets of civil society and governance.

The Role of Universities

USAID is tapping the university community more and more effectively, particularly through regular high-level faculty and student exchanges and joint research programs. Universities are unique because they can bring a breadth of specialists from many different disciplines and with different viewpoints to address a problem. As a general matter, universities can generate great ideas, but

technology transfer concerns and modalities to bring products to market are also critical issues to address. For example, some universities are successful at moving software and health care services to market, but less experienced in providing development solutions.

Improvements and cultural change at USAID have been underway for several years, but the last two years have been extraordinary, especially with regard to university engagement. Early on in April 2008, USAID, the State Department, and the Department of Education hosted a Summit on Higher Education attended by over 300 university presidents and provosts from the United States and abroad to discuss new modalities for cooperation. Subsequently, four regional conferences provided momentum for the summit and helped to further strengthen networks between universities, governments and other stakeholders.

Many faculty members are already pioneering and using new tools for development solutions, but universities still need better guidance on how to define problems and focus on the most important development questions. USAID's widely acclaimed Higher Education Solutions Network (HESN) is already providing opportunities to cultivate such guidance. At the same time, it will also foster new partnerships between universities, USAID, and foreign development counterparts while tapping into the outsized contributions made by student engagement. As part of the HESN initiative, a first cohort of seven universities was selected for funding in November 2012 to provide a range of expertise in value-added agriculture, health services, geospatial data management, disaster recovery and assistance, and entrepreneurship and innovation.⁹⁴

In the modern context of "soft power" for diplomacy and development, it is now widely appreciated that some of America's best ambassadors are scientists and engineers. Development institutions need to take better advantage of these individuals. Assets for USAID and State are also being augmented through professional fellowships. American Association for the Advancement of Science (AAAS) Fellows and Jefferson Science Fellows, for example, bring fresh energy and impetus to science and engineering challenges in diplomacy and development.⁹⁵ In addition, a great reservoir of U.S. immigrants — the diaspora — is also a powerful asset through which development activities are being

⁹⁴ To learn more about the Higher Education Solutions Network, see the HESN Homepage, available at <www.usaid.gov/hesn>.

⁹⁵ American Association for the Advancement of Sciences (AAAS) are Ph.D.'s in their fields recruited annually by AAAS to serve in 1–2 year assignments in the executive branch and Congress. They bring experience from the academic, research and public and private sectors, and many are hired by their host institutions, including USAID and State Department, on a permanent basis. Jefferson Fellows are tenured professors of science and engineering embedded at USAID and State for one-year assignments and, upon returning to their universities, remain available as subject matter experts for an unlimited period. These professors can engage their own global research and academic networks to support and influence US diplomacy and development initiatives and programs.

cultivated, including activities that support the empowerment of women and youth who view naturalized American role models from their countries with great respect, especially in the sciences and engineering fields.

Institutions and Millennials as Connectors

Assistance institutions, facilitators, and convener organizations such as USAID, international development banks, and U.N. organizations, must evolve to better connect people and assets in order to provide sustainable, scalable and resilient development solutions. For example, USAID's suite of Grand Challenges demonstrates the power of defining a problem, not dictating a solution, and then using crowdsourcing to identify viable, impactful, and scalable solutions.⁹⁶

Development institutions should not abandon their traditional programs. Infrastructure for water, energy and communication services, schools, food staples, vaccines and medicines, for example, cannot be provided by the "Twitter sphere" alone. Traditional programs will continue to require further support and funding even as they become more sustainable. However, with new paradigms evolving, development institutions will increasingly partner with other actors such as private companies and universities. Together, these actors will create "centers of excellence" that are capable of addressing multiple development issues with multidisciplinary approaches, rather than treating scientific or technical challenges in isolation.

Students and millennials⁹⁷ all around the world are hungry with idealism and passion for addressing development issues and helping the less fortunate. They are connected to one another in unprecedented ways through their formal education and exchange programs, fields of research and social networking spaces and online communities that are second nature to them. In the developed world, and increasingly in developing countries, millennials are worldlier and more traveled than their parents were at their age. In short, American students and their foreign counterparts are quickly becoming global collaborators and innovators and they represent perhaps the single most powerful new asset in the 21st century development sphere. Traditional institutions and stakeholders must cultivate and harness this potential as quickly as possible.

⁹⁶ USAID's Grand Challenges for Development Initiative aims to define problems, identify constraints, and provide evidence-based analysis. Thus far, four Grand Challenges have been launched. For more information about USAID's Grand Challenges, see the homepage, available at <www.usaid.gov/grandchallenges>.

⁹⁷ The Millennials are current teens and twenty-something's transitioning into adulthood. For more information on Millennials, see Paul Taylor and Scott Keeter, ed., *Millennials: A Portrait of Generation Next* (Washington, DC: Pew Research Center, February 2010, available at <www.pewresearch.org/millennials/>).

Metrics, Administrative and Programmatic Challenges

USAID and its stakeholders and funders should be more open to the value of strategic planning for development in the medium- to long-term, particularly in the science, technology, and engineering spheres where long lead times are needed for success. At the same time it is critical to serve stakeholders' needs for measureable program milestones and results in the shorter term of one to three years. Data analysis is critical to answer these needs, particularly metadata analysis in an era when raw information and knowledge are increasing exponentially. Better metrics are also needed to inform policymakers and donors about the importance of incorporating science, technology, and engineering into development programming.

Funding mechanisms also pose administrative challenges, particularly when attempting to provide resources to non-traditional institutions and individuals. Procurement changes are also needed to move USAID from its tradition of funding large contractors who meet all specifications to a more flexible model for funding more experts with innovative approaches with smaller awards. Small and medium enterprises can also be targeted to harness smaller, “off-grid” technologies with excellent potential for development applications including, for example, small-scale renewable energy platforms, water purification technologies, health services technologies and mobile phone and broadband systems. It is said that innovation is easy, but procurement is hard. USAID is already beginning to embrace many of these new, non-traditional funding approaches to leverage investments in the faster cycles of the modern “aidscape.”

Other U.S. Government agencies can serve as excellent development partners. For example, the National Science Foundation's Partnerships in Enhanced Engagement in Research (PEER) program with USAID funds meritorious scientific and technical research between USAID and developing country counterparts, and it is already underway.⁹⁸ The Agency has also cultivated a similar partnership with the National Institutes of Health. The elevation of development on equal footing with diplomacy and defense — as called for in the National Security Strategy and the QDDR — is critical to the United State's economic and national security interests. Furthermore, the QDDR has called for “Whole-of-government” and even “Whole-of-society” partnerships to achieve our diplomacy and development objectives. USAID has opened a large aperture of cooperation to engage in the modern aidscape with the U.S. Geological Service, the Department of Energy, the Department of Agriculture and the National Aeronautics and Space Administration, and efforts with NGOs and academia are moving ahead briskly in parallel.

⁹⁸ For more information about Partnerships in Enhanced Engagement in Research, see their Homepage, available at <<http://sites.nationalacademies.org/pga/dsc/peer/index.htm>>.

Last Word

The 21st century “aidscape” presents enormous challenges and opportunities for all development stakeholders. Open architecture for information and data exchange, analysis and new modalities of cooperation and innovation characterize the new “aidscape.” Governments remain vital funders and facilitators for development, but they and other traditional development organizations must adapt to the shifting development landscape and the global information society or risk losing relevancy and influence. In particular, they must change organizational behavior to become better facilitators and connectors for and between these numerous individuals and new stakeholders. Entrepreneurs among these stakeholders, including small and medium enterprises with innovative approaches and technologies yet untapped for development, should be identified and targeted for special attention. Their contributions to development also represents a new generation of trade opportunities for the United States.

While it is true that “there are no facts about the future,”⁹⁹ strategic planning and analysis of medium- and long-term trends provide important context for development priorities and programs. Building a strategic planning and futures analysis capacity at USAID to consistently examine alternative scenarios, challenges and opportunities should be at the very heart of a revitalized science based Agency.

Finally, a new generation of citizens and passionate millennials are being empowered by increased global connectivity and the mobility of intellectual capital resulting from the rapid deployment of communications technology and internet services. These individuals represent some of the most powerful, new potential assets for the development sphere. It is in the self-interest of the development community to embrace and leverage these assets, especially in the face of limited development resources. Traditional development organizations such as governments, the United Nations, international development banks, and non-governmental organizations will need to reach out to these new partners in order to adapt to this new reality and to harness the enormous opportunity these partners represent to shape the 21st century aidscape.

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99 Administrator Lincoln E. Moses, Preamble to *The Annual Report to Congress*—1978, DOE/EIA-0036/1 & 2 (Washington, DC: U.S. Department of Energy, February 1978).

Politics and Economies

Over the past few years, the world has witnessed dramatic shifts in both the global economy and in worldwide political trends.

Developing countries and economies in transition are shifting the balance of power on the world's economic stage. The World Bank reports that almost half of the world's economic growth can be attributed to developing countries. In 2009 and 2010, China issued more loans to developing nations than the World Bank. In terms of political change, the implications of the Arab Spring, which changed the political landscape of the Middle East, are yet to be fully assessed. The civil war in Syria and the insurgency in Mali are testaments to the notion that political

change can be unpredictable and destabilizing. All of these factors, economic and political, will impact the way the global community does development.

During the “*politics and economies*” panels at the USAID Symposium, these issues drew considerable discussion. Panelists engaged questions on topics such as shifting donor-recipient relationships, economic uncertainty, the role of political institutions, and a growing number of new strategic partnerships. Throughout the discussion, several key changes and challenges emerged.

One topic that dominated discussion was the changing role of the nation-state. Although states remain key actors, the ‘playing field’ has diversified dramatically in recent years, and many other stakeholders now have the power to influence the future of development. Panelists discussed the importance of engaging not only national governments, but also regional and local governing bodies as well as institutions, civil society, and the private sector. With the spread of information communications technologies, citizens throughout the world are making their voices heard. Despite the increased number and power of non-traditional actors, it was noted that ultimately, success is unlikely if key political decision-makers are not involved in processes.

A second discussion trend which surfaced in this track was the high degree of interconnect- edness of current trends and the increased complexity of the development landscape in

general. For example, issues pertaining to water, land, agriculture, migration, and rising inequality all require the attention of governance. One panelist stated that food insecurity is a direct result of poor governance. Another pointed out the fact that fragile new democracies often find it difficult to provide basic services to citizens. The technology to produce food exists; droughts and famine, for the most part, are predictable. Governments must develop the institutional capacity to make public goods accessible to their citizens. Rapid urbanization is another demography-related phenomenon that is tied to governance. Megacities in particular create a unique challenge for governments striving to provide basic goods and services to their populations. If development challenges such as these are to be overcome, political will must be present.

The importance of forging strategies to mitigate economic shocks was also underscored.

Developing countries, not unlike developed ones, will face sizable challenges to sustain economic growth and to cope with rising demand for goods and services from a newly emerging middle class. The global community must learn to better predict and prepare for economic downturns in order to bolster microeconomic resilience. One strategy for doing this would be to create stronger regional integration among countries.

Finally, one of the most salient trends discussed in these panels involved the shifting donor landscape. USAID regularly graduates countries from development assistance. These “graduates” become success stories, such as South Korea and Costa Rica, and in many cases, they become donor countries themselves like Brazil and India. Trilateral cooperation is becoming more frequent and is a great way to leverage available knowledge and resources. Additionally, the BRICs are changing the face of international development.

While spending on foreign assistance by developed countries is stagnating, foreign assistance from emerging economies like China, Brazil, and India is growing fast. Western donors must learn to cooperate and collaborate with these economies. The challenge over the next 25 years will be to widen the team of nations supporting international development initiatives and to forge strategies together that will support a more equitable and prosperous world.

Beyond Traditional Foreign Assistance: USAID's Future Role with Middle-Income Countries

Daniel Runde discusses new approaches that are necessary to dramatically transform a now outdated and ineffectual donor engagement strategy.

The foreign assistance landscape has changed drastically over the past several years. With the rise of emerging donors, unprecedented levels of private sector engagement, an expanded role of foundations, and the explosions of public-private partnerships, the foreign assistance landscape of yesterday has become a memory. The size and velocity of private capital flows to the developing world, peer-to-peer philanthropy, and other economic spigots have forever changed the financial role of traditional donors. All of these issues sparked lively discussion at the USAID Symposium on Future Development Challenges. This was especially so in the “politics and economics” forum where time and again speakers asked: What will USAID’s role be in the future, and how will it mobilize still sizable resources — capital and human — to meet the development challenges of the 21st century? Participants were quick to point out that while much has changed, persistent challenges like illiteracy, under-nutrition, and corruption are still widespread. New trends like global climate change and rapid urbanization are posing their own unique challenge to sustainable development.

By all accounts, the Agency’s programming and planning efforts have traditionally focused on aid delivery over the shorter term. Country strategies, for example, usually map assistance two to five years into the future. But the pace of change in the development landscape has skyrocketed as seemingly distant events such as rapid urbanization and climate change arrive upon the Agency’s front doorstep. New players in the development arena, huge shifts in the economic balance of power, unpredictable political changes and other developments will

force USAID to become more flexible, innovative, and future focused in order to stay afloat and to thrive. In short, the traditional donor-recipient model is out of date and ill-equipped to address today's economic and political realities. The role of trade, often undervalued for development, new funding mechanisms and partnership opportunities, and a greatly expanded role for science and technology all emerged as front and center issues at the symposium. Keeping all of these developments in mind, this chapter explores a new role for the now 50-plus-year-old development agency.

Today's Budget and Strategic Realities

Official development assistance is at a crossroads, and the U. S. Government is one of many traditional donors having to make difficult choices about the direction and extent of their assistance programming. Budget cuts during recent years of austerity have affected every sector of government, including development agencies. The U.S. Agency for International Development (USAID), despite using only a small fraction of the federal budget, has had to make do with less-than-ideal budget realities.

Yet shrinking budgets are only one aspect of the changing nature of development assistance. Many traditional recipients of foreign aid from the United States and other OECD (Organization for Economic Co-operation and Development) countries have made tremendous strides in terms of economic growth, announcing themselves as equal players with the rich countries of the Global North. China, India, and Brazil are just a few examples of countries that have undergone economic transformation, lifting hundreds of millions of people out of poverty in the last two decades. Continuing to provide such powerful nations with traditional foreign assistance is therefore incongruous with today's economic and political realities. In fact, many countries that have reached or surpassed middle-income status have established their own bilateral foreign aid agencies or agendas, to varying degrees of sophistication, such as the Brazilian Agency for Cooperation (ABC) and the Indian Development Partnership Administration. Traditional U.S. assistance to these countries, some with multitrillion dollar economies, is not only less effective as far as meeting global development goals, but less strategic from a broader U.S. foreign policy perspective as well.

Although U.S. Government development resources are focused in the world's poorest regions and countries, and in conflict and disaster-affected zones, this is not to say that there is no longer a need for assistance to middle-income countries. On the contrary, certain USAID activities, such as its democracy and governance programming in non-democratic countries (such as, until recently, its support for Russian civil society organizations), merit continuation even when economic realities suggest otherwise. Rather, the U.S. Government should begin

shifting its relationships with middle-income countries from a donor-donee approach towards more of a partnership model. USAID is already assuming the role of facilitator for these transitions, such as in Panama, but these efforts should be scaled up and across the breadth of USAID's reach, as the phenomenon of rapid economic growth is visible on every continent. As will be described below, helping these emerging players become better donors should be a vital component of USAID's engagement strategy. In a number of countries, including Brazil, USAID is already pursuing this, with promising results.

Boosting Trade

Another way to expand U.S. partnerships with middle-income countries is to do away with trade restrictions, and in select cases, work towards free trade agreements (FTAs). The U.S. Congress last year ratified FTAs with Panama, South Korea, and Colombia,¹⁰⁰ all countries with very positive experiences with U.S. assistance (the USAID mission in Panama completed its activities, as scheduled, in September 2012).¹⁰¹ It is certainly no coincidence that in places with a strong legacy of U.S. development assistance, a powerful trade relationship with the United States has blossomed. As Table 1 shows, middle-income countries that underwent effective transitions out of traditional USAID assistance witnessed exponential growth in their trade with the United States, a trend that holds to this day.

Transitioning from traditional foreign assistance and pursuing a partnership with a country is nothing new for the U.S. Government, but it remains, as always, a challenging proposition. Transitions in the past, as a result, have yielded mixed results in the long term.

One of the most important considerations for pursuing a transition away from traditional foreign aid is whether the transition threatens to undermine USAID's legacy in that country. USAID has been operating in some countries for decades and has made fundamental contributions to the long-term prosperity of those countries. For instance, USAID was instrumental in bringing the Green Revolution to India, which turned that country into an agricultural exporter.¹⁰² Also in the agricultural sphere, USAID helped the Brazilian Government start up Embrapa,¹⁰³ which is now among the most innovative agricultural research agencies in the world.

¹⁰⁰ "U.S.-Korea Free Trade Agreement," *Office of United States Trade Representative*, accessed January 31, 2012, available at <www.ustr.gov/trade-agreements/free-trade-agreements/korus-fta>.

¹⁰¹ Carol Elron, "Welcome to our website," *USAID Panama*, 2011, <www.usaid.gov/pa/Information/Documents/Message%20from%20the%20Acting%20Mission%20Director_FINAL.July%206%202011.pdf>.

¹⁰² "Great USAID Projects in History: IFFCO," *ACDI/VOCA*, available at <www.acdivoca.org/site/ID/Feature-Great-USAID-Projects-in-History-IFFCO>.

¹⁰³ Isadora Ferreira, "From Famine to Feast in Brazil," *USAID Frontlines*, November/December 2011, available at <www.usaid.gov/press/frontlines/fl_nov11/FL_nov11_50_BRAZIL.html>.

Table I Moving from Aid to Trade, 1985–2011

<i>Country and Year</i>	<i>Bilateral Trade in Goods with the United States millions of dollars, on a nominal basis</i>
Costa Rica	
1985	923.0
1990	1,991.7
1996 (USAID transition)	3,790.6
1997	4,347.7
1999	6,348.5
2011	16,236.5
Portugal	
1985 (USAID transition)	1,240.5
1986	1,189.9
1990	1,754.2
2005	3,460.6
2011	3,903.0
South Korea	
1980 (USAID transition)	9,118
1983	12,952
1985	15,969.6
1990	32,889.6
2001	57,362.2
2011	100,140.5
Lithuania	
1998	143.0
1999	163.0
2000 (USAID transition)	194.6
2001	264.2
2005	1,023.9
2011	2,186.3
Tunisia	
1993	273.0
1994 (USAID transition)	381.2
1995	285.3
2000	383.2
2011	938.0

Sources: “U.S. Trade in Goods by Country,” *U.S. Census Bureau*, available at <www.census.gov/foreign-trade/balance/>; Larry L. Burmeister, “Development Dilemma: Trade Pressures and Agricultural Sector Adjustment,” *Asian Survey* 30, no. 7 (July 1990), 711–723.

As USAID draws down its traditional assistance in places like Brazil and India, it is critical that the transitions are not so abrupt as to make a clean break with the countless contributions that USAID missions have made over the years. This caveat is not an exaggeration of the risk, as a number of transitions in the past were not so smooth, particularly with respect to transitions in several

African countries in the 1990s. In some cases, both USAID partners and employees felt that the nature of the transition did not do justice to the legacy of USAID work in the countries in question.

In cases such as South Korea, Costa Rica, and Portugal, planning in advance allowed USAID and its partners to establish bi-national legacy institutions that have worked to carry the bilateral relationship forward, even many years after USAID ended its activities there. While bi-national institutions may not be feasible in every case, they present a sustainable and powerful instrument for both sides, donor and recipient. These institutions are generally entrusted with an endowment, with contributions from the private sector, and therefore require no further taxpayer funding going forward. At a time when it is increasingly difficult to secure support for important development programming, legacy instruments are perhaps an underappreciated approach to reshaping the U.S. relationship with middle-income countries. However, securing endowment authority from the U.S. Congress is in itself a challenging task as well; thus, it is important to explore the potential for endowment authority for a series of countries as soon as possible.

Scenario Planning

Another reality that USAID history teaches us is that foreign assistance transitions often cannot be planned exactly too far in advance. On more than one occasion, there has been an attempt to formulate some sort of objective metrics for determining when a transition should take place, looking at social and economic indices to come up with “magic numbers.” These efforts have been inconclusive, however, and in general, attempting to identify clear-cut rules for transitions is probably asking the wrong question. The focus, rather, should be on being prepared to transition at any moment, as the ultimate decision to do so will be influenced by political or budgetary realities, often outside the scope of USAID policy. What happened in Russia in September 2012 starkly illustrates this situation. USAID was forced to stop funding all activities in Russia because of what the Russian Government demanded, not because of strategic planning by USAID. Fortunately, USAID had been strategically reducing the scope of its activities in Russia over the last several years, narrowing its focus sectors one by one, but USAID goals and partners alike were hurt by the abrupt farewell. It is quite possible that other governments will make similar demands of USAID in the coming years, for various reasons, and the Agency needs to be prepared for both the best- and worst-case scenarios. This is why scenario planning, a vital component of futures analysis, must become central to USAID thinking.

Nevertheless, a number of countries can be readily identified where U.S. foreign assistance is likely to wind down over the next decade, and in these cases, programming should immediately be focused towards establishing a long-term

bilateral cooperation partnership rather than following the traditional model of development assistance. Although there can be no objective rubric for determining when exactly the time for transition has come, as mentioned above, there are a number of indicators that are handy points of reference. When a country possesses a sophisticated space program, its own foreign assistance agency, a sovereign wealth fund, and/or membership in the G-20, then it can safely be said that traditional USAID programs do not have a long future in that country. At the same time, these indicators suggest that the country in question is ready (and eager) for a broadened cooperation partnership with the United States. Brazil, which recently became the sixth-largest economy in the world, is a prime example of this phenomenon.¹⁰⁴ Countries like Brazil are eager to shed the traditional foreign aid relationship with the United States and pursue deeper cooperation.

Linking Communication and Transition

In all assistance transitions, communication is key; a fact attested to by USAID officials who were involved with such transitions in the past.¹⁰⁵ In addition to USAID, these transitions involve a variety of actors: other U.S. Government elements (including Congress), partner non-governmental organizations (NGOs, local and American), recipient-country government ministries, and multilateral institutions. Effective transitions, historically, have involved close coordination between USAID and these other stakeholders, well in advance of the ultimate transition. In addition to USAID, the U.S. Government has a number of other non-traditional development instruments at its disposal, such as the U.S. Trade and Development Agency, the Overseas Private Investment Corporation, and the Export-Import Bank. These agencies all have important roles to play in any assistance transition, and USAID should further expand its cooperation with them. These non-traditional assistance giving actors have the added benefit of advancing U.S. interests and yielding development returns with little to no extra cost to the American taxpayer. The Development Credit Authority (DCA), an instrument of USAID itself, accomplishes development goals with similarly cost-effective methods.¹⁰⁶ DCA should be expanded and applied in more settings.

¹⁰⁴ Philip Inman, "Brazil's economy overtakes UK to become world's sixth largest," *The Guardian*, March 6, 2012, available at <www.guardian.co.uk/business/2012/mar/06/brazil-economy-worlds-sixth-largest>.

¹⁰⁵ Interview with William Paupe, former senior USAID official present at the close of the South Korea mission, September 21, 2011.

¹⁰⁶ *United States Agency for International Development, Office of Development Credit, Credit Guarantees: Promoting Private Investment in Development—2010 Year in Review* (Washington, DC: USAID, 2010), available at <www.usaid.gov/our_work/economic_growth_and_trade/development_credit/YIR_2010.pdf>.

Fostering Cooperation

The post-foreign assistance partnership can also take the form of development cooperation. Triangular cooperation is an increasingly popular form of delivering foreign assistance, and USAID is already exploring this approach. In triangular cooperation, two donor countries partner together for development projects in a third country. The two donor agencies leverage their comparative advantages in order to achieve a greater development outcome than either could individually. These comparative advantages include access to a wide range of capabilities and resources, whether financial, technical, cultural, or even linguistic. In Lusophone Africa, for example, USAID and Brazilian partners are pursuing triangular cooperation.¹⁰⁷ USAID has also partnered with the Indian Government in Africa,¹⁰⁸ and such collaborative development pursuits are likely to increase in the near future.

Of course, coordinating two (or more) donors is never easy. The experiences of the Organization for Economic Co-operation and Development, which has sought to coordinate donors for decades, can attest to this challenge. As a result, the extent and impact of triangular cooperation have been limited to date. Results will certainly improve moving forward, as all sides gain experience with this still novel approach. Triangular cooperation's shortcomings so far can be explained in part by the differences in capabilities across various development agencies. Some new donor countries do not have a distinct bilateral development agency like USAID, while others that do (such as Brazil) are still newcomers to the field. Until agencies such as the Brazilian Agency for Cooperation mature to more closely match USAID's scale, coordination will likely remain difficult. This discrepancy nevertheless offers USAID the opportunity to help strengthen and expand other countries' nascent development programs. Certainly, USAID already does so to an extent. In Brazil, USAID and ABC are currently implementing an exchange program, in which employees from one agency spend time at the other in order to learn, teach, and bring the two agencies closer together. Such collaboration is encouraging, and ideally, more exchange mechanisms can be set up, not only in other countries, but also in such a way that allows officials from other countries' development agencies to spend time at USAID headquarters in Washington.

Every country's needs and desires, with respect to its relationship with the United States, are unique. However, there are a number of sectors in which the majority of middle-income countries want to expand their cooperation with the United States. Science and technology, for instance, continues to be an area of strong interest throughout the world. As one of the global leaders in

107 "Brazil, the U.S. and Mozambique Sign Agreement for Trilateral Cooperation," *U.S. Agency for International Development*, January 23, 2012, available at <<http://brazil.usaid.gov/en/node/1368>>.

108 "A Partnership for an Evergreen Revolution," *U.S. Agency for International Development*, available at <www.usaid.gov/indiatrip/evergreen_revolution.pdf>.

this field, the United States has much to offer middle-income countries, but it can gain a great deal from them as well. USAID has helped many countries expand their capabilities vis-à-vis science and technology, and recipients of U.S. assistance are hungry for more collaboration in this area. Recently, USAID and the Federation of Indian Chambers of Commerce and Industry launched an initiative around “frugal innovation,”¹⁰⁹ India’s unique brand of low-cost, high-impact technologies. U.S. development goals would certainly benefit from bringing products inspired by frugal innovation to scale in the developing world. U.S. relationships with middle-income countries, especially in a post-foreign aid context, should have plenty of room for partnerships around science and technology. In 2010, USAID established a new Office of Science and Technology in the Bureau of Policy, Planning, and Learning; this was a giant step in the right direction.

On a related note, educational and professional exchange programs with the United States are also extremely popular among emerging countries. Person-to-person exchanges are in fact among the best ways to link two societies together. In the past, USAID-supported exchanges of Americans and South Koreans built the personal relationships that inextricably link the United States with South Korea in one of the strongest alliances. Now the U.S. Government and those of other countries alike are recognizing the importance of sponsoring such mechanisms. Brazil launched its Science Without Borders initiative, which is supposed to supply 100,000 Brazilian students and researchers with scholarships to travel abroad, with most likely to come to the United States.¹¹⁰ The U.S. Government introduced a similar program — 100,000 Strong in the Americas — to send just as many Americans throughout the Western Hemisphere.¹¹¹ There is much appetite for this type of collaboration in other parts of the world as well, and USAID can help lay the groundwork for broadening bilateral partnerships on this front.

As the number of global donors increases and the capabilities of middle-income countries rise, there is still at least one area in which the United States offers a unique development export: civil society. American civil society is extremely active and well-developed compared to most countries, especially emerging ones. USAID, unsurprisingly, has implemented some of the most extensive and successful civil society development programs throughout the world, including in countries where the growth of native civil society is extremely hindered by political or other restrictions. In addition to supporting and professionalizing the NGO sector, USAID also has much to offer emerging

109 “USAID and FICCI Announce Millennium Alliance,” Federation of Indian Chambers of Commerce and Industry (FICCI), December 20, 2011, available at <www.ficci.com/pressrelease/846/press-ficci-dec20-USAID.pdf>.

110 “Brazil’s Science Without Borders Program: About the Program,” Institute of International Education, available at <<http://www.iie.org/en/Programs/Brazil-Science-Without-Borders/About>>.

111 Phillip Kurata, “U.S., Brazil Expand and Deepen Cooperation,” *United States Diplomatic Missions to Brazil*, April 9, 2012, <<http://brazil.usembassy.gov/usbexpand.html>>.

countries in terms of creating an architecture of philanthropy. Unlike in the United States, many societies lack the incentives (such as an effective tax code) that encourage philanthropy. Bringing some of the American experience to these countries would help their civil societies flourish the way their economies have, and there is still much work to be done in this realm. Even if USAID missions lack the resources or time to undertake this challenge, they can engage the right partners to pursue this important work, or help establish bi-national institutions that can house these activities long-term.

Overall, it is becoming more and more important for USAID to become highly more creative and innovative, and to shed traditional approaches and models of thinking, particularly with respect to middle-income countries. To a large extent, USAID has risen to the challenge, but there remains much work to be done to position the Agency even more effectively. USAID will have to tread more lightly, engage outside partners more actively and strategically, and find more non-traditional sources of support than ever before, in order to simultaneously serve international development goals and U.S. foreign policy interests at a time of shrinking resources and changing global realities.

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The United States, Latin America, and the Caribbean: Securing Recovery and Prosperity through Deeper Economic Partnership

Leonardo Martinez-Diaz examines the growing economic trends that are strengthening links between the United States and Latin America and the Caribbean.

The Futures Symposium session on “politics and economies” raised a number of powerful arguments for the positive development impacts of a growing and robust uptick in world-wide trade. This is one trend that seems likely to continue unabated over the next decade.

Considerable discussion focused on new trading partnerships among regions, especially between African countries. Also in play were issues on evolving trade between Africa and Asia. Serious debate was generated over the challenge of building future trading partnerships while expanding existing ones. A number of speakers highlighted the importance of reducing economic uncertainties in developing and middle income countries along with developing strategies to mitigate unforeseen economic shocks. Another prevalent issue discussed was how to prepare nations to anticipate and prepare for economic downturns in order to strengthen their economic resilience. One approach that received sizable discussion revolved around how the United States could facilitate more durable economic regional integration among countries and between developing, middle income and emerging donor countries.

With these issues as a backdrop, this chapter aims to shed light on the complex and ever tightening economic links that connect the United States and the countries of Latin America and the Caribbean. Understanding the nature of these links is important if we are to promote the kind of future economic growth that will help the countries of the Western Hemisphere secure prosperity and address central development challenges in the coming years. While the region has experienced a deep and mostly positive economic, political, and social

transformation in the past 25 years, important challenges remain, including how to ensure that globalization leads to broad-based growth in all our countries. In addressing those challenges, the United States, Latin America, and the Caribbean will need one another more than ever before.

This chapter is divided into three parts. The first section argues that closer economic links with the countries of Latin America and the Caribbean will be critical if we are to accelerate and sustain U.S. economic growth and job creation. The reason is that changes in the hemisphere are making many of those economies more dynamic and resilient than ever before, and their policy frameworks have made them more credible, responsible, and reliable economic partners.

The second section argues that the U.S. economy will prove indispensable for the countries of Latin America and the Caribbean if they are to achieve their full economic potential in the coming years and join the ranks of the world's most prosperous societies. This is because the United States will continue to offer the biggest and most open markets for goods and services, the deepest and most liquid capital markets, and a unique capacity for innovation and entrepreneurship. The last section provides some examples of how the U.S. Government, and the U.S. Treasury in particular, is working to deepen economic relationships with the hemisphere.

Latin America's Importance to American Growth and Recovery

The United States is more interconnected to Latin America and the Caribbean than any other region in the world. Fifty million people — one in six Americans — identify as Hispanic or Latino and trace their roots to Latin America or the Caribbean. The United States exports to the region \$370 billion worth of goods and services per year — three-and-a-half times more than the United States exports to China and 30 percent more than it exports to the European Union.¹¹² A third of global imports of crude oil come from Latin America, and nearly a fifth of high-skilled migrants admitted into the United States every year through the H1B visa program are from Latin America and the Caribbean. These immigrants fuel innovation and growth in the U.S. economy.

A Quarter-Century of Progress

Given the long-standing relations between the United States and other countries in the hemisphere, it is easy to lose sight of how much the Latin American and Caribbean economies have individually evolved in the last two decades. At the

112 Francisco J. Sanchez, *Doing Business in Latin America: Positive Trends but Serious Challenges*, Testimony to the U.S. Senate Committee on Foreign Relations Subcommittee on Western Hemisphere, Peace Corps, and Global Narcotics, 112th Congress, July 31, 2012, available at <www.foreign.senate.gov/hearings/doing_business-in-latin-america-positive-trends-but-serious-challenges>.

beginning of the 1990s, Latin America was emerging from a “lost decade” of zero net growth. Poverty and inequality were stubbornly high, and hyperinflation was common. Fiscal imbalances were dangerously unsustainable, and banking and currency crises were chronic.

Since then, the region’s economy has more than doubled in real terms, inequality has declined, and poverty has fallen significantly, from 48 percent in 1990 to 30 percent in 2011.¹¹³ Inflation is mostly in the single digits, financial systems are generally stable, and macroeconomic frameworks in most countries sound. Several countries in Latin America are even engines of inclusive, sustainable, and balanced growth in a world economy that badly needs it.

Latin America and the Caribbean will prove critical for accelerating and sustaining U.S. growth and job creation for several reasons. First, the region is expected to continue growing, and to do so at a faster rate than the mature economies and many emerging ones. One of the clearest reasons this growth matters to the United States is trade. Exports to Latin America alone made a significant contribution to U.S. growth in the period immediately preceding the 2008 crisis. And in the aftermath of the crisis, exports to Latin American economies have contributed more to U.S. recovery than exports to any other region of the world.

Another reason why the region will be critical for U.S. growth is that Latin America’s already large middle class is expected to keep expanding. According to the United Nations Economic Commission¹¹⁴ for Latin America and the Caribbean, the number of middle-class households in the region grew by 56 million in the past two decades. The region’s middle class population has expanded by some 150 million people, the equivalent of half the population of the United States. Sustained growth, even if at slower rates, will enable Latin America’s middle class to keep growing.

And third, an unprecedented level of resilience is evident in many countries of the region. Latin American economies were highly vulnerable to negative shifts in global economic conditions in the 1980s and 1990s. Weak financial systems and unsustainable debt structures magnified external shocks — when the United States caught a cold, Latin American countries would get pneumonia.

But the region’s experience in 2008 reflects an historic shift. Colombia and Peru maintained positive growth throughout the crisis, and most of those that did suffer downturns have experienced quick recoveries. Many economies in the region are better-equipped to absorb external shocks and capitalize on positive global conditions than in the past. As downturns affect other regions of the world, the countries of Latin America act as sources of stability and support for the global economy, and thereby contribute to recovery in the United States.

¹¹³ *Statistical Yearbook for Latin America and the Caribbean* (New York: United Nations, 2002).

¹¹⁴ Osvaldo Rosales and Mikio Kuwayama, *China and Latin America and the Caribbean: Building a Strategic Economic and Trade Relationship* (New York: United Nations ECLAC, 2012), III.

No economy is immune to the risk of temporary reversals, but Latin America and the Caribbean are poised to maintain strong growth in the medium and long term because their growth is underpinned by four powerful factors: demographics, competitiveness, capital, and prudent economic policy.

Demographics

The region's demographic advantage, relative to the rest of the world, becomes clearest after analyzing dependency ratios, which measure the number of working-age persons in an economy relative to those that are not in the labor force. According to U.N. projections, Latin America has 20 years before there are 50 dependents for every 100 persons of working age.¹¹⁵

Then, the ratios will start to rise, but the slope of that curve will only become steep after 2040. By comparison, in 2035, China's dependency ratio will equal Latin America's, and then rapidly exceed it. This translates into a two-decade demographic dividend in Latin America and the Caribbean, during which conditions will be favorable for saving and investing in activities that increase future economic growth.

Competitiveness

Latin American manufacturing, particularly in Mexico, is becoming increasingly competitive relative to China and other East Asian economies. Recent statistics suggest that wages in Chinese manufacturing grew by an average annual rate of 19 percent in dollar terms from 2005-10, and anecdotal evidence suggests wages are still rising due to tightening labor market conditions.¹¹⁶ In contrast, Mexican manufacturing wages measured in dollars remain very competitive. Though China has seen stronger productivity gains that offset a substantial portion of the rising cost of labor, the closing wage gap will make some Latin American countries increasingly attractive as bases for investing and manufacturing, provided that they make the necessary investments.

Global Capital

Global capital flows into Latin America and the Caribbean will likely continue to grow. Expectations about relatively high future growth rates, coupled with slower growth in some mature economies, will push capital in search of higher returns to the region, as long as adequate policy frameworks remain in place. These capital flows will make up for low savings rates in many countries, and help the region capitalize on its demographic dividend.

115 Leonardo Martinez-Diaz, *Latin America: Coming of Age* (World Policy Institution, 2008), 222, available at <www.brookings.edu/~media/research/files/articles/2008/10/fall-latin-america-martinez-diaz/fall_latina_martinez_diaz.pdf>.

116 Harold L. Sirkin and Michale Zinser, *Made in America, Again: Why Manufacturing Will Return to the U.S.* (Boston: Boston Consulting Group 2011), 7.

An Emerging Latin American Framework for Stability and Growth

The last — and arguably most important — driver underpinning Latin America's bright prospects is related to policy choices. A very similar economic policy framework is taking root simultaneously in many countries across the region, in countries as diverse as Mexico, El Salvador, Uruguay, Peru, and Brazil. This framework is above all pragmatic and home-grown. It is being embraced by governments of all political stripes across the region, and its advantages over alternative frameworks are quickly becoming clear to all.

The framework spreading across Latin America has two components. The first is a stability component, which has several elements.

Fiscal discipline and transparency are enabling countries to avoid unsustainable debt burdens, secure reliable access to international capital markets, and provide room for countercyclical fiscal policies. In addition, *credible monetary anchors*, such as inflation-targeting regimes, have been implemented by seven Latin American economies, including the two largest, Brazil and Mexico. Well-contained inflation has allowed countries to adopt more flexible exchange rate regimes. In turn, greater *exchange rate flexibility* has afforded these countries more room to manage external shocks at lower cost in terms of growth and employment, discourage dangerous buildups of foreign debt and currency mismatches in the private sector, and avoid speculative attacks. *Well-regulated and capitalized financial systems* have been critical in helping the region weather the 2008 global crisis. However, there remains much to be done if the financial systems are to be both stable and sufficiently developed to support sophisticated, globally integrated economies.

The second component of the Latin American economic framework has to do with promoting sustainable, inclusive growth. Large and well-focused *investments in education, infrastructure, and R&D*, which are widely recognized as essential for competing effectively in the global economy, are vital for growth. Further, most countries in the region now recognize that private enterprise is the most powerful engine for growth and innovation, even where the state retains a significant presence in the economy. For this reason, they are adopting *regulatory frameworks that encourage private entrepreneurship*. Countries as diverse as Jamaica, Honduras, and Colombia have embraced *rules-based, open trading regimes*, which have proven instrumental in helping emerging market countries take advantage of global opportunities.

Openness to capital flows, in the context of effective financial regulation, is another element essential for sustainable growth. In 2011, Latin America and the Caribbean received \$113 billion in foreign direct investment (FDI), continuing a strong upward trend that is providing the region with the capital it needs to keep growing.¹¹⁷ Measures to mitigate inequality of opportunity and protect the most

¹¹⁷ *Foreign Direct Investment: in Latin America and the Caribbean* (New York: United Nations CEPAL/ECLAC, 2011), 24.

vulnerable populations are essential for broad-based economic growth. Conditional cash transfer programs, pioneered by Mexico and Brazil, have been implemented to great success throughout the region. Efficient and increasingly progressive tax regimes are being embraced both for equity considerations and to ensure that the state can deliver key services, especially to the poorest citizens. Finally, stabilization funds and other measures to protect economies from declines in commodity prices have been adopted by, or are being considered in, many Latin American countries.

The U.S. Economy's Importance to Latin America's Development

Although much has been achieved in recent years, it is important not to obscure the fact that Latin American and Caribbean countries still face enormous economic and development challenges. In many places, poverty remains endemic, income and wealth inequality alarmingly high, social exclusion pervasive, and vulnerability to natural disasters a constant preoccupation.

In the Caribbean, there is concern of a self-reinforcing triangle of low growth, deteriorating fiscal positions, and financial-sector stress. Mexico and Central America face crime and insecurity that risk undermining institutions and draining economic dynamism. In countries such as El Salvador, insecurity may be costing the economy as much as 8 percent of GDP every year,¹¹⁸ and that does not take into account the direct human cost. And while there are stories of economic dynamism in Latin America, the reality is that real GDP per capita has grown much too slowly in the last 25 years, especially when compared to the most successful emerging-market economies, those in East Asia.

Effectively addressing these challenges will require growth that is strong, sustained, and inclusive. And that will depend on how the countries of the region adapt to a changing global economy and leverage its most valuable opportunities.

In the coming years, the United States will provide many of these opportunities. Deeper economic engagement with the United States will be critical for Latin American and Caribbean countries as they seek to become societies that are more prosperous, fair, and secure.

Trade Diversification

The United States is the world's largest market and is geographically close to the region. In addition, U.S. markets remain among the most open in the world, providing ample opportunities to Latin American exporters, even as protectionist currents emerge in other parts of the world. The United States will play a particularly important role for countries looking to diversify their export baskets.

118 Rodrigo Serrano-Berthet and Humberto Lopez, *Crime and Violence in Central America: A Developing Challenge* (Washington, DC: The World Bank 2012), 6.

Brazil is a case in point. Brazil's trade with China has grown dramatically in the last decade, but the composition of that trade has come to resemble that of U.S.-Brazilian trade in the 1950s. Over 85 percent of Brazil's exports to China are basic goods and raw materials, while more than 90 percent of Brazil's imports from China are manufactured or capital goods. In 2011, Brazil ran a deficit in manufactured goods trade with China that exceeded \$25 billion, up from \$800 million in 2003.¹¹⁹

The Brazilian and U.S. economies are complementary in a different way. About half of Brazilian exports to the United States are manufactured goods — regional aircraft, auto engines, cellular phones, and machinery. In turn, Brazil imports from the United States large commercial aircraft, semiconductors, and computer equipment. If the European economy grows more slowly in years to come, the U.S. market will become even more important as a source of opportunities for Brazilian industry, and as a solution to Brazil's need to diversify its exports and move up the value chain.

The Brazilian case is not unique. A similar story exists in Peru, where 80 percent of China-bound exports are metals and minerals, but 40 percent of U.S.-bound exports are higher-value,¹²⁰ non-traditional goods. Trade with the United States helps Peru diversify exports and create jobs.

Source of Capital and Investment Opportunities

In addition to vital international trade, the United States will also remain an indispensable source of capital for Latin America. The United States is the largest investor in the region, providing nearly a fifth of all foreign direct investment (FDI) each year. U.S. companies have over \$200 billion invested in Latin American and Caribbean countries,¹²¹ and U.S. capital markets, which remain the deepest and most liquid in the world, continue to help the region's governments and companies raise financing.

At the same time, the United States will prove an important source of investment opportunities for Latin American and Caribbean investors and entrepreneurs seeking new horizons. In 2010, outward FDI from Latin America and the Caribbean reached an all-time high, of \$43 billion.¹²² Most of these investments were by multinational companies based in Mexico, Brazil, Colombia, and Chile. Mexico-based *Grupo Bimbo* is now the largest baking goods company in the United States, with 34 bakeries in 13 states, employing

119 "Brazil's Trade Policy: Seeking Protection," *The Economist*, January 14, 2012, 1, available at <www.economist.com/node/21542780>.

120 Osvaldo Rosales and Mikio Kuwayama, *China and Latin America and the Caribbean: Building a strategic economic and trade relationship* (New York: United Nations ECLAC, 2012), 15.

121 *Survey of Current Business* (Washington, DC: Department of Commerce, Bureau of Economic Analysis, 2012), 139.

122 *Foreign Direct Investment: in Latin America and the Caribbean* (New York: United Nations ECLAC, 2011), 12.

15,000 workers.¹²³ The Brazilian steelmaker Gerdau, which produces steel in 19 American states, employs 10,000 workers.

Diaspora Entrepreneurs and Networks

Finally, the United States remains home to over 50 million people who trace their roots to Latin America and the Caribbean. These communities represent one of the greatest potential collective assets for the United States. Diaspora communities link the United States with Mexico, Guatemala, Colombia, El Salvador, the Dominican Republic, Jamaica, Haiti, and other countries. They support their home countries by sending more than \$40 billion in remittances each year.¹²⁴ Perhaps more importantly, diaspora communities have increasingly become agents of change in private enterprise, combining American business know-how with knowledge of local markets in Latin America to build successful businesses — both in the United States and in their countries of origin — that generate growth and connect the hemisphere.

Seizing the Opportunities

The U.S. Treasury will support countries implementing the stability and growth framework described above through various tools. These include bilateral and multilateral policy dialogues, policy actions in the executive boards of the IMF, World Bank Group, and Inter-American Development Bank (IDB), and Treasury's technical assistance capability. Currently, this assistance is helping build institutional capacity in 10 Latin American and Caribbean countries through dozens of programs.

The Treasury will continue to strengthen economic and financial partnerships with the region's largest economies. In Brazil, the ministerial-level Economic and Financial Dialogue seeks to forge stronger collaboration on infrastructure finance and international macroeconomic issues. Mexico, one of the Treasury's closest partners on a range of economic and financial issues, will remain connected through rigorous dialogue as the country has become a global leader in advancing financial inclusion. The Treasury is committed to strengthening and deepening its relationship with G-20 member Argentina after it addresses concerns in a variety of areas, including engagement with international institutions and payment of final International Centre for Settlement of Investment Disputes awards and Paris Club debt. The Treasury also works with regional G-20 partners to advance common interests, including resisting protectionism in trade and investment and addressing

¹²³ Christopher Wilson, *Working Together: Economic Ties between the United States and Mexico* (Washington, DC: Wilson Center, 2011), 25.

¹²⁴ R. Maldonado, N. Bajuk, M. Hayem, *Remittances to Latin America and the Caribbean: Regaining Growth*, Multilateral Investment Fund (Washington, DC: Inter-American Development Fund, 2011), 5.

global imbalances.

The Treasury will also continue to support and collaborate with Latin American- and Caribbean-led efforts to build more effective regional economic institutions. The United States supported a historic capital increase for the IDB, the largest provider of multilateral investment in Latin America, as well as replenishment of the Fund for Special Operations, which supports the region's poorest countries. The capital increase has doubled the IDB's annual disbursement capacity, from \$6 billion to \$12 billion. The Treasury will continue to encourage the IDB to sharpen its focus on tackling poverty in the hemisphere, building public-private partnerships, and advancing regional integration initiatives, particularly in infrastructure.

The United States welcomes the growth of effective and innovative regional institutions, such as the Andean Development Corporation (CAF), which has recently been rebranded as the Development Bank for Latin America. CAF has emerged as a leading regional provider of capital for infrastructure investment. Further, the Integrated Latin American Market, or MILA, is an ongoing effort to pool the stock markets of Chile, Colombia, Peru, and Mexico. If successful, the MILA would provide an effective mechanism for deepening capital markets in member economies and attracting equity investment from across the region and the world. The Treasury also plans to engage more closely with regional institutions in the Caribbean, especially the Organization of Eastern Caribbean States and the Eastern Caribbean Central Bank.

Looking forward, the Treasury will also endeavor to promote development and resilience for the poorest and most vulnerable populations in the hemisphere. President Barack Obama has affirmed this commitment. At the Summit of the Americas in Trinidad and Tobago in 2009, Obama launched the MiGroFund, an innovative public private-partnership to help ensure access to capital for microfinance funds strained by the financial crisis. During the G-20 Small- and Medium-sized Enterprises (SME) Finance Challenge in 2010, the Treasury marshaled over \$500 million to support innovative proposals to improve access to finance by SMEs. Together with Canada, Spain, Mexico, and Colombia, the United States launched the multi-million dollar Crossroads Fund to support high-impact cross-border infrastructure projects in Central America and the Caribbean. And, through the Administration's Partnership for Growth (PfG) efforts, the Treasury is working with El Salvador to identify and eliminate constraints to economic growth.

Finally, the Treasury will deepen its work with the U.S. private sector and the financial community to raise awareness of hemispheric opportunities, and to remove barriers to doing business in the region. Lately, it is often noted that U.S. businesses are not as engaged in the region as they once were, or as they should be, given Latin America's economic potential. Indeed, while the United States remains the largest single source of FDI in the region, its share of the total has declined significantly in recent years. This is ironic, given that Latin America

today offers not just competitive rates of return, but also a more politically and economically stable environment than ever before. In collaboration with colleagues at Commerce, State, and the United States Trade Representative the Department of the Treasury will continue to work with U.S. businesses and investors to ensure that they can compete on an even playing field and are well-informed of the valuable opportunities that exist in the hemisphere.

This is a special moment of opportunity that must be seized, both in the United States and across the hemisphere. A deeper, more mature economic relationship between countries will prove increasingly important for economic growth and job creation in the United States. And, at the same time, access to the opportunities the U.S. economy provides will help countries throughout the region capitalize on this auspicious period of stability and growth to address key development challenges.

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Environment

Climate change is substantially affecting countries around the world.

Rapid and widespread environmental changes will impact development in a number of significant ways. Growing resource scarcity, population movements, increased risks of communicable diseases, and increased conflicts are just a few of the potential consequences of a changing environment. Concurrently, biodiversity promises to serve as a buffer against some of the detrimental effects of climate change.

Topics such as climate change, decreasing biodiversity, resource scarcity, and the importance of resilience were discussed. The most central question that guided the conversation was:

How do we do development work without sacrificing global environmental sustainability? How can future gains be achieved without damaging the environment, especially in the face of global climate change?

Although climate change has often been lumped in with discussions about the environment, it was noted that these two issues need to be considered separately. Climate change is not something that needs to be protected, nor is it an outcome that should be achieved. It is a force that can severely damage resources that need protecting, and its effects such as rising sea levels, forest degradation, and

species destruction undermine development efforts. The effects of climate change are cross-sectoral, and it can impact the way we think about population, agriculture, economic growth, health and conflict. Climate change is clearly a phenomenon that must be viewed as a very broad development issue, not just as a narrowly defined environmental one.

Also discussed was the problem of sharply decreasing biodiversity. Changes such as population growth, economic development, and climate change combine to impact the availability of water, soil, timber, and energy resources. Desertification in the Sahel is taking place at an alarming rate and a large portion of the African population is currently living in dry, increasingly unfertile places. Roughly 20 percent of the global population lives in water scarce areas. It is estimated that by 2030, that number will grow to 47 percent. Simultaneously, tropical forests across the world are shrinking in

size and entire ecosystems are disappearing.

Lively discussions centered on in the interconnectedness of water, food, and energy scarcity and the need to approach these issues collectively. All of these resources are highly integrated, and the development community must thus work to ensure that solutions are also integrative. The potential of using public-private partnerships to achieve development goals was also highlighted. Major companies such as Coca-Cola, Adidas, and IKEA are now incorporating environment programs into their corporate social responsibility policies and view issues such as environmental degradation, energy scarcity, and climate change as business risks. Public and private sector actors will have a greater chance of engaging governments, changing policies, and making an impact if they work together.

Efforts to improve conservation and strengthen resilience must be simultaneously top-down and bottom-up. Without

political will, legal frameworks that can help protect the environment will not be implemented. Without the help of NGOs and local communities, information dissemination campaigns about the importance of minimizing environmental harm will not be successful.

It was suggested that development professionals learn to make better use of science and technology to tackle difficult environmental challenges. Geographic information systems, for example, can be used to provide information to help development practitioners monitor forest fires, floods, and drought. Mobile banking projects and cell phone technology can be used to help farmers implement adaptation strategies. Investments in wind and solar power can provide electricity to populations living in informal settlements in cities such as Nairobi and Mumbai which are experiencing dramatic growth.

Panelists concluded with five policy-oriented questions: How

can USAID, as a bilateral agency in a trans-boundary world, develop regional links to increase program resilience? What should be done now to strengthen cooperation between U.S. Government agencies to improve capacity-building to address climate change? Can more effective resource management overcome some of these environmental challenges? What role can science and technology play in mitigating these threats? What changes are needed in national and local government to minimize environmental threats?

The Periphery Isn't Peripheral: Addressing Future Trends Through Integrated Analysis and Development

Geoffrey Dabelko addresses the unrealistic expectations and analytic inadequacies that are hindering global development progress on the environment.

Bureaucratic stovepipes undermine international development efforts to improve human well-being and the environment. These problems are fundamentally interconnected, but development aid for addressing pressing environmental and human security concerns — such as climate change, food shortages, fresh water access, and global health threats — rarely matches the reality on the ground in the developing world. The shortcomings of bureaucratic stovepipes pervade not only the environmental realm but also all development sectors. Understanding and responding to these challenges are key to achieving lasting success in development. These concerns were among the top issues that surfaced at the U.S. Agency for International Development's (USAID's) Symposium on Future Development Challenges held in Washington in 2011.

Development efforts aimed at addressing these long-term trends, whether spearheaded by multilaterals, bilaterals, or non-governmental organizations, are commonly devoted to single-sector approaches. There are many reasons for this narrow focus: finite resources, tight funding streams, simple and discrete indicators of success, and institutional and professional development penalties for those who conduct integrated work. But integrating problem-solving initiatives across traditional environmental and health categories may not only improve the efficacy of development efforts, but also better improve lives in target communities.

Integrated analysis of environmental, demographic, political, economic, and health trends and development programs that combine environmental and health interventions offer many potential benefits:

- Incorporating a wider range of critical variables, both within and outside their traditional disciplines, will allow researchers to fully realize the potential of long-term trend analysis.
- Understanding how trends in other sectors could intersect with their programs will help practitioners avoid unintended consequences; for example, a program should ensure that a climate intervention does not inadvertently spur conflict, or a health intervention does not account for the impact of climate change.
- Combining environment and health efforts in integrated development programs for example can not only save practitioners money and time, but also produce better results due to greater community buy-in.

If integrated analysis offers so many benefits to analysts and researchers, communities on the ground, and the development workers in the field, why is it so hard to do? Why is there such a big mismatch between the nature of the problems and the bureaucratic solutions typically deployed?

Barriers to Integrated Development: The Four Tyrannies

Four main barriers impede more effective response to long-range, complex, and multi-scale health and environmental challenges. These “tyrannies” often prevent development workers from conducting integrated, long-term analysis and developing integrated programs.

- The “tyranny of the inbox” for the development practitioner, no matter where one works, is ever-present. The necessity of responding to the immediate crisis or the hot political priority blocks long-term diagnosis, design, and response. These priority items commonly add up to more than a full-time job for the development practitioner, especially in an agency such as USAID that is only beginning to recover from historical efforts to eviscerate its workforce. At the same time, the velocity of today’s changes means that *over the horizon* challenges with sizable development implications receive much less attention.
- The “tyranny of immediate results” is driven by absurdly short timelines for both projects and funding. The expectation that research or projects produce positive and meaningful results within a year or two does not pass the laugh test in terms of a sustainable and successful approach. The demand for immediate results coupled with the heavy workload generates the common lament that development practitioners do not have time to think about long-term trends and projects do not have time to produce meaningful results.
- The “tyranny of the single sector” dominates the tool box despite

growing rhetoric and occasional forays into integrated approaches that reflect the complex, interconnected challenges of development. That very complexity encourages practitioners to “stay within their wheelhouse” thus reinforcing disciplinary or bureaucratic homogeneity. Many often feel that “my issues are tough enough” without introducing other drivers or responses to the equation.

- The “tyranny of the uni-dimensional measurement of success” is the logical extension of the single-sector focus. The admirable focus on results and indicators of success has also pushed a reductionist approach that cannot handle the messiness of multi-topic indicators. For example, clear and immediate health indicators — such as vaccination rates — do not combine easily with long-term conservation indicators, where success may be actions not taken, such as deforestation avoided. Add in measuring impact at ecosystem or atmospheric scales, and impact and evaluation assessments for integrated projects become even more challenging.

All four of these tyrannies (and there are probably more) impede integrated analysis of long-term trends across issue areas and scales, and prevent development practitioners from acting on these insights to design and implement integrated programs.

Integration in Practice: Success Stories

These tyrannies can be conquered, as demonstrated by some notable successes. A few integrated development programs in Asia, the Philippines, and the Democratic Republic of the Congo illustrate how integrated trend analysis is critical to understanding future development and demonstrate ways to address these challenges in an integrated fashion.

Asia’s Future Trends: Before tackling integrated programs, we should start with a better understanding of health and environment trends and the interconnections among them. USAID Asia Bureau staff recognized that a wide set of climate, energy, economic, governance, and conflict issues affected their core biodiversity and water portfolios, even if they did not have the time, expertise, or resources to investigate those issues in detail. Trends that appeared at first glance (and certainly by budget line) to be in the periphery were not peripheral to planning and designing programs for long-term success.

Working with the Woodrow Wilson Center, USAID engaged experts on a diverse set of topics normally considered outside their portfolios. The resulting workshop series and report *Asia’s Future: Critical Thinking for a Changing Environment* led to a deeper understanding of the possible impacts of these

future trends, such as the potential consequences of increased Himalayan glacier melt and Chinese hydropower plans on food security and biodiversity programs in the lower reaches of the Mekong River.

Bringing analysis from these topically and geographically remote areas into local-level development planning is a process that requires practitioners to be willing to go outside the typical bounds of their brief. More simply, if you know everyone at the meeting or on the project team, you are not doing your job.

The Democratic Republic of the Congo (DRC): Mercy Corps has successfully pursued cross-sectoral programming as part of a larger effort to be more holistic in its humanitarian and development responses. In war-torn eastern DRC, Mercy Corps brought practitioners with expertise in natural resource management into what has historically been an emergency relief mission. In particular, the Mercy Corps mission fused humanitarian assistance with longer-term development efforts such as enhanced environmental stewardship. For example, the use of fuel-efficient cookstoves eases pressure on local forest resources by reducing the demand for firewood, and improves respiratory health by lowering air pollution. The project scaled up the effort through resources from further integration, with carbon credits from avoided emissions being sold through a local broker to the European cap and trade market. These resources in turn helped finance more cook stoves. If integration and long-term efforts in climate change can be practiced in the highly unstable regions of eastern Congo, then such integrated projects and marrying long-term development and short-term crisis response could be possible in other difficult settings.

Philippines: The PATH Foundation Philippines' Integrated Population and Coastal Resource Management (IPOPCORM) initiative uses an integrated approach to address health, population, and environmental concerns in coastal communities. Their "basket of services" includes establishing a locally managed protected marine sanctuary to allow local fish stocks to recover, promoting alternative economic livelihoods outside of the fishing industry, and improving access to local health services and commodities, including family planning. To date, IPOPCORM has yielded several notable improvements, among them reduced program costs and improved health and environmental outcomes as compared to side-by-side single sector interventions. According to a peer-reviewed study, IPOPCORM's integrated efforts yielded better results than single-sector interventions in cost and most of the indicators tracked.

Reaching the Center: The Integration Imperative

What has been on the periphery of our portfolios is no longer peripheral. Cross-sectoral programming demands that old problems be addressed in innovative and

perhaps unfamiliar ways, requiring the addition of new capacity in development organizations and better coordination within and between agencies. Still, significant hurdles remain standing in the way of regular and effective integration. To overcome them, we must:

Get out of our comfort zone: Development practitioners need to work across disciplinary, topical, and geographic groupings to become conversant — if not fluent — in the languages, tools, and goals of communities reflecting the many trends that bear on environmental challenges. Moving beyond the stereotypes, suspicions, and ignorance about other communities can come through a much more meaningful investment in human resources and their development.

Find better ways to collaborate: Policy practitioners must have greater facility with science, and scientists must better understand policy processes. We must be willing to develop non-traditional partnerships that bring other skill sets to the table. We must transition from integrated analysis of problems (where we are improving) to integrated actions (where we still struggle).

Lower the transaction costs: We must incentivize, rather than punish, cross-disciplinary or cross-sectoral approaches; put a premium on multiple wins and co-benefits from single or coordinated interventions; and foster measurement that allows for different time frames and multiple indicators.

Build flexible institutions: We are so focused on incremental change that it is difficult for us to understand the connections and changes that are occurring. We must build organizations for which variability, and not stasis, is the norm.

Think long-term: We need to stay ahead of the development curve in today's fast-paced world. The velocity of change demands that we look more closely at emerging trends five, 10, and 15 years out because these development trends require action today. We must build and sustain the capacity to do future trends analysis to support anticipatory efforts.

This essay offers only a glimpse of what integrated analysis and programming can look like if the tyrannies are conquered and the imperative answered. Integrated efforts are not only responding to long-term trends inside and outside the environment sector. Fundamentally, they are responding to the interconnected realities of the world's poor.

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Security Must Be Integrated, Say Experts,” *New Security Beat*, August 9, 2010, available at <www.newsecuritybeat.org/2010/08/there-is-no-choice-climate-health-water-food-security-must-be-integrated-say-experts/>.

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Part 3

Conclusion

Strategic Vision: Foresight Research for Development

Leon Fuerth, one of the leading thinkers and foresight research advocates, analyzes why current linear thinking about today's development challenges is a dead end.

Strategic vision is the conceptualization of an alternative future, deemed to have such major societal benefits as to be worthy of the risks, sacrifices, and tenacity required to secure it. Foresight research can be described as a process for systematically identifying plausible alternative futures, and for studying on a comparative basis the ways in which short-term behavior can influence long-term, strategic consequences. Simple, linear models of causal relationships, which have profoundly influenced the substance of public policy and the organization of governance, are both common and wrong. Complexity theory offers a far more accurate description of these relationships, with major implications for strategic vision and foresight research, for substantive policy and for policymaking systems.

Strategic Vision, Foresight Research and International Development

There is without doubt a moral imperative behind American and most other forms of bi-national assistance for development. Certainly this imperative is a major factor behind the activities of religious groups and other donors as reflected in their programs on education, health care, nutrition, etc. The moral imperative is also central to the activity of major privately established foundations. Likewise, the moral imperative has also been important in the development activities of multinational institutions such as the United Nations. It's fair to say, however, that the development of international assistance as

practiced by the U. S. Government owes much more to its perceived utility as a factor in geo-strategic competition, with strong commercial and ideological undertones.

International development seemed destined to proceed in a “linear” fashion (a term further explored later in this chapter) as the result of an accretion of progress in areas such as agricultural productivity, infant mortality, female economic empowerment, and a numerous other factors. The world has made progress in each of these endeavors, but there is still a long way to go. Humankind is in the midst of an intensely transformative period in development. The next industrial revolution is already underway, emerging from the abrupt appearance of new systems of finance and production, with profound consequences extending well beyond near-term economic and geo-strategic competition. For example, climate change has already begun to have a sizable impact. We are no longer in a race to prevent it from happening, but rather, to prevent its effects from exceeding the adaptive capacity of industrial civilization. Furthermore, a spontaneous merger of human and artificial intelligence is underway. Natural evolution is being displaced by human design and intervention. We must come to grips with new, “ultra-long range” policy issues relating to the potential of the human species, and even more to its prospects for survival.

These events are unfolding with such velocity as to telescope the long-range future of development and short-range planning in ways that the international community should now be grappling with. The United States should be leading the way. A new American strategic vision is needed, and the key to it is foresight research (which is also described in detail later in this paper). Within the U.S. Government, USAID’s strategic mission places it at the point of intersection between the old, linear conception of development and the new complex, non-linear development reality that has taken hold. USAID can help to inspire the nation and the larger global community by pioneering the application of foresight research to its own planning and operations.

USAID must analyze how traditional activity areas such as human rights, agriculture, nutrition and health, workforce development, disease prevention, and environmental protection relate to the ongoing global revolutions that are creating new challenges and opportunities across the world. In this context, various new questions arise. What do human rights mean, stacked up against the doctrine that suggests “corporations are people?” Is there a path to higher agricultural productivity, other than genetically modifying crops whose seeds do not reproduce? How should increasing demands for protein be balanced against the impact of withholding grains from human consumption to serve as cattle feed or fuel for automobiles? What are the feedback effects of climate change on agricultural practices? How shall disease control be managed to deal with plunging effectiveness of antibiotics overused to stimulate meat production? What can be done to protect local environments against planetary scale climate

change? When should programs of adjustment be readied to compensate for climatic disruption? The list of urgent questions alone could fill many pages.

In Chemistry 101, one learns that there is a difference between endothermal and exothermal reactions: the former require an external source of energy in order to keep running; the latter have passed a tipping point, beyond which they self-generate enough energy to continue. This is a useful distinction to keep in mind, when thinking about the kind of transition that has only recently occurred in international development. Bilateral international assistance is endothermal in the sense that when it ceases, the processes that it set in motion also tend to die out. However, in some parts of the world development has abruptly shifted to something that looks much more like a self-sustaining, exothermal process — for example, the extraordinary growth of the Chinese economy and other emerging economies such as Brazil and India. This marks a new stage in a global economy whose center of gravity is shifting from the strictly western form of capitalism, of which the United States is the avatar, to the variant which is evolving in China and elsewhere. In the course of this abrupt transition, development has shifted from an essentially linear process to one that is accelerating and increasingly complex.

In the face of new global developments such as the rapid growth of megacities in Africa and Asia; the growing demand for food, water, and energy resources; the explosion of science and technology; and a dynamically changing world-power landscape, it will be vital for USAID to have a foresight process in place to facilitate long-term thinking. It will also be important for USAID to take the lead role in encouraging developing countries and emerging economies to develop foresight research on their own, or to tap into capabilities that already exist. In light of trends that clearly point to the need for global efforts to deal proactively with the consequences of accelerating global change, achieving strategic vision is especially important for governance in both developed and developing countries. This is not something that can work on a top-down basis. The prior linear relationship between donors and recipients does not help either group come to terms with the fact that they are mutually entwined in a complex global system.

The U.S. Government, unfortunately, does not currently have this capability in place. Perhaps the next Administration will recognize and respond to the need. In the meantime, there is good reason for USAID to experiment with it at its own level. Much of the world's misery comes from bad or ineffective governance, rather than from the way nature and history dealt the cards. In the globalized world, knowledge and vision beget development. USAID must shift away from linear analyses in order to tackle today's global challenges.

The Basic Lexicon

Terms such as strategy, strategic vision, foresight, foresight research, national interest, national security, stability, sustainability, etc. are used frequently — but not always precisely — in futures analysis and theoretical discourse about policies that have measureable, life-changing consequences not only for Americans, but for hundreds of millions of other people.

U.S. National Security

National security, development assistance, and diplomacy are inextricably linked. American thinking about national security was formed during the second half of the 20th century by the experience of World War II and the Cold War. As a result, national security is often conflated with national defense. In the 21st century, however, it is clear that national defense is actually a subset of national security. If raw military power is the key to security, America has little to worry about. But what does it mean if the country is skirting economic failure, despite being armed to the teeth? What does it mean — in a world where information literally is power — if primary and secondary education is failing to lift the minds of tens of millions of the youngest students, while higher education is only available to millions of college age students, in exchange for the equivalent of indentured servitude to commercial lenders? What does it mean when the nation is so bitterly divided that government cannot deal with the most fundamental public needs, other than by a series of patchwork compromises that buy time but solve no problems? And what does it mean when the rest of the world — friends and enemies alike — view the United States as mired in this condition? A broader definition of national security is clearly needed. National security is the integral sum of sustained, world-class American performance in all domains that contribute to the general vitality of the United States: economic power, military power, human resources, and moral confidence.

American Strategy and Strategic Vision

The basic strategy of the United States is to indefinitely preserve a well-functioning republic which is able, under demanding and continuously changing circumstances, to safeguard the security, the freedoms, and the well-being of Americans under the rule of law, by employing the mechanisms of self-government as laid out in the Constitution. The national interest is to acquire and to safeguard assets that are conducive to the vitality of the nation as a whole, measured in terms of its economic growth, its cohesion as a society, and its ability to maintain national security. American strategic vision, which began with the idea of attaining a “more perfect Union,” now acknowledges that the national destiny is inseparably entwined with that of others. Thus, it is in America’s interest to pursue goals that address universal aspirations. This translates into a more just and stable global order based on democracy, the rule of law, respect for human rights, and private economic initiative in a sustainable physical

environment. Stability is often included as part of the American strategic vision, but it is a tricky concept. Perfect stability does not exist in any political system, unless an effort is made to suppress change by force. Dynamic equilibrium, on the other hand, can be maintained providing there is periodic, consensual adjustment. This underscores the importance of democracy as a strategic goal.

Foresight and Foresight Research

Foresight research was a central discussion point at the Symposium on Future Development Challenges and came up in each of the session panels. Foresight is the capacity to visualize alternative futures, based on models of how these forces may interact. Foresight research is a systematic effort to acquire information about the future, presented as an array of alternatives, by using methodologies that are transparent to all interested parties and subject to critical evaluation by them. Foresight is analytic, and estimative rather than predictive. It requires a fusion of capabilities: historical awareness, systems awareness, and forecasting methodologies. Foresight aims to be dispassionate about particular outcomes, concerning itself with description rather than prescription. In this regard, foresight is absolutely distinct from prophesy, which relies on inspiration as opposed to analysis. Foresight may be the product of individual imagination, or of a large collective effort. Either way, however, it does not stand on authority but on propositions that must be demonstrated. It is therefore an offset to the nearly prophetic certitudes of political life. Effective leadership requires strategic vision, but good management requires foresight.

Complexity: Strategic Vision, Foresight Research and Systems

As cited earlier in this chapter, understanding the non-linear relationship between global events and trends is essential. Political discourse today, however, assumes that the world is a collection of linear relationships — much like the world of Newtonian physics. In this world, inputs and outputs — actions and consequences — can be segregated and dealt with on the basis of an underlying mathematical relationship. Changes of input produce proportionate and predictable changes of output; relationships between input and output hold true across a very broad range of conditions over long periods of time. But in reality, especially in a global development context, relationships are far from linear. They are complex — much as they are in the worlds of relativistic and quantum physics. Inputs and outputs — actions and consequences — cannot be isolated. At any given moment all the elements of a complex system are simultaneously interacting: both the drivers and the driven. Changes of input at any point can produce disproportionate changes of state across the entire system. These changes can involve catastrophic disruption of patterns to which we are habituated. For example, changes in trade policy might have multiple unpredictable implications.

The relationships that govern the world, and the place of the United States

within it, are not linear systems in which actors may decide whether or not to engage, but complex systems into which they are embedded, simultaneously driving events and being driven by them. Complexity theory¹²⁵ has profound implications for American policy (including development policy) at all levels and in all substantive domains: domestic and international; defense and economics; and short and long term. It also has implications for our systems of governance. In linear systems, policies and their consequences can, in theory, be studied in isolation, and their management can be handled by vertically organized departments. In a complex system, however, policies and their consequences are interactive and must be studied and acted upon concurrently. Complexity undermines any assertion that a policy can be perfect and permanent. All policies are imperfect at the moment of inception and will become more so over time. Management becomes the art of knowing how to bring about timely adjustment to changing circumstances, rather than the practice of an ill-advised consistency.

Disruptive Change

Starting in the late 20th century, and increasingly in the early period of the 21st century, the dominant characteristics of societal development became complex and began to accelerate. If there is a theoretical reason for this, most likely it would be Moore's Law, which describes the geometric increase in computer speed and its inverse consequence: the geometric decline in the cost of computer-based transactions, which, in turn is the basis for the explosive spread of the Internet, under the impulse of venture capitalism. Governance has been unable to keep pace. This is partly due to the severe politicization that now affects decision-making. But it is also a consequence of the fact that our systems of governance were organized on a linear basis, reflecting methods typical of the "high" industrial age: vertical organization; top-down management; information-hoarding, and the like. Bureaucratic functions are adapted for incremental responses to incrementally changing conditions. They cannot handle disruptive change, which is the kind of change actually taking place. At home, public confidence in our form of governance has been badly damaged. The same is true of public opinion in the European Union. In the developing world, democratic governance is not looking good in contrast to its main alternative: Chinese capitalism. That in turn, will make it much harder for the United States and its allies to mobilize support for the kind of global order that would be most suitable for the maintenance of the American way of life and the practice of development assistance.

¹²⁵ Of all the sources for Complexity Theory that I might identify, the late James N. Rosenau, not only my personal friend but a validator, a sounding board, and a colleague was deeply at home in the search for meaning and wisdom in human affairs. See James N. Rosenau, *Distant Proximities: Dynamics Beyond Globalization* (Princeton, NJ: Princeton University Press, 2003).

Forward Engagement

Current information systems serving senior levels of government are generally sufficient (although not always) for planning for the short term. They are absolutely deficient for long term planning. At their current capacity, they are incapable of tracking the transition of events from prospective to actual. More so than ever before, trends are transitioning more rapidly, and possible events are becoming occurring events in the blink of an eye. These types of transitions have the potential to overwhelm the adaptive capacities of our governance system — presenting major challenges that mature at a rate far in excess of the rate at which we might adjust. The amount of time and effort required to shift the course of opinion, programming, and operations, has increased exponentially — notwithstanding the tremendous national advantages enjoyed earlier in U.S. history. America could be badly damaged by a powerful emergent development recognized too late for effective repositioning.

Anticipatory Governance

The fusion of foresight and policy is at the heart of anticipatory governance. Anticipatory governance requires upgrades to existing White House processes in three areas: systems to encourage a constant interaction between long-term foresight and short-term decision-making; systems to facilitate “whole of governance” responses to complex issues; and systems to apply the concept of feedback, to the management of policy, in light of results. My recent report on Anticipatory Governance, published by the National Defense University, represents a major effort to bring theory and practice together for the first time.¹²⁶ One of the precepts of this work was that all recommendations must be applicable under realistic circumstances: very light on resources, implementable under existing presidential authorities, and compatible with the existing processes in government. Although the report focused on the U.S. executive branch, many of its conclusions about the kind of governance needed to deal with accelerated change are clearly applicable to international development in general, and to the operations of all agencies of the U.S. Government that are stakeholders in the process, especially USAID.

Conclusion

The days of creating policy based on a linear conceptualization of world events and global trends are at an end. U.S. policy, to meet today’s realities, requires complex analysis that is forward thinking and focused on the long term. The future of development — once visualized in terms of all things made proportionately better, in a world more or less still recognizable in social,

¹²⁶ Leon S. Fuerth, with Evan M. H. Faber, *Anticipatory Governance Practical Upgrades: Equipping the Executive Branch to Cope with Increasing Speed and Complexity of Major Challenges* (Washington DC: NDU Press, October 2012). The report is available at www.forwardengagement.org.

economic and political terms — has turned out to be a wave of change sweeping hundreds of millions of people into unknown territory. In a best case scenario, we will find ways to adapt to this rate of change and might “surf” it to a new world, better than the old. In a worst case scenario, chaotic, non-linear change will bring about extreme social turbulence in the midst of an increasingly inhospitable planetary environment. Strategic vision, linked to foresight research, is needed in order to facilitate decision-making domestically, internationally, and ultimately at the level of the complex global system that is establishing itself as the basis for planetary-scale development.

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Can Global Development Progress Continue?

Three Future Scenarios and What They Depend On

Steven Radelet makes a convincing case that the global context for development is changing exponentially and explores three starkly different future scenarios.

With the U.S. Agency for International Development (USAID) holding the *first-ever* Symposium on Future Development Challenges in Washington in late 2011, the Agency has turned a page by focusing significant analytical energies and Agency leadership attention on the importance of identifying emerging development trends. The Agency is beginning to ask this fundamental question: What will the future of development look like in 2025? To put that future view into a sharper perspective, it makes sense to begin with a current assessment.

Let us start with a key observation, often missed: There has been greater progress in global development and poverty reduction in the last 20 years than at any time in the history of the world. Developing countries are experiencing unprecedented reductions in poverty, increases in income, improvements in health and education, and in many cases, shifts towards democracy and improved governance. Of course, many other countries (and regions within countries) continue to make little or no progress at all. The two clearest patterns among developing countries since the early 1990s are vast improvement and divergence. A growing number are achieving important development gains while many others are being left behind.

In the midst of these improvements, and partly because of them, the global context for development is changing rapidly. Incomes and capabilities are rising quickly, private capital flows to developing countries have grown enormously, there are far more democracies with more capable and accountable governments,

cell phones and other technologies are creating tremendous new opportunities, and a plethora of new donors and foundations have entered the scene.

Developing country progress during the last 20 years provides a strong foundation for further economic growth and poverty reduction to continue and possibly even accelerate in the future. But there is no guarantee that this progress will be sustained, much less accelerated and spread to other countries. Significant new development challenges are arising, including tensions from rapid economic powers, religious and cultural divisions, and growing environmental pressures from demographic shifts, resource demands, and climate change. What might the future of development look like? Can the progress be sustained, or will it be derailed? And what do these outcomes depend on?

A Snapshot of Global Development Progress

During the 1960s a growing number of low-income countries began to achieve rapid growth and poverty reduction. The progress was centered in East Asia, as countries deepened their trade and integration with a resurgent Japan and with the United States. In 1980 the re-awakening of China opened vast new opportunities for 1 billion of the world's poor, and India began to surge in 1990. While progress centered in Asia, it was not exclusively an Asian phenomenon. Countries such as Botswana, Mauritius, Costa Rica, the Dominican Republic, Turkey, Tunisia, and others made significant gains.

Since the mid-1990s, both the pace and the breadth of global development progress have accelerated markedly. The big change came with the end of the Cold War and the collapse of the Soviet Union. Strong forms of state control and socialism lost credibility, authoritarian dictators began to disappear in favor of democratically elected governments, and more countries began to integrate with the global economy. Development progress spread more widely to Eastern Europe, Central Asia, Latin America, and Africa. Whereas during 1960–95 there were 31 developing countries that achieved more than 2.2 percent per capita growth, the long-term North American and European average, since 1995 more than twice that number, 73 developing countries, have exceeded that benchmark. In just 15 years in these countries, real incomes have increased 60 percent, infant mortality rates have plunged 35 percent, and gross primary school enrollment rates jumped 13 percent. Democracy is much more widespread. In sub-Saharan Africa alone, the number of democracies has grown from three in 1989 to more than 20 today.¹²⁷ And most dramatically, the number of people living in extreme poverty (with incomes less than \$1.25/day) has fallen sharply from over 1.9 billion in 1993 to less than 1.3 billion in 2008, a reduction by one-third in just 15 years.¹²⁸

¹²⁷ Steven Radelet, *Emerging Africa: How 17 Countries are Leading the Way* (Washington, DC: Center for Global Development, 2010).

¹²⁸ Steve Radelet, Rachel Bahn and Sarah Lane, "Rising Out of Poverty," *USAID Impact Blog*, May 8, 2012, available at <<http://blog.usaid.gov/2012/05/rising-out-of-poverty/>>.

Of course, despite this huge progress, the global development picture is far from universally positive. Many other countries (or regions within countries) have made little or no progress, with stagnating or declining incomes and little change in poverty. After all, there are still 1.3 billion people living on \$1.25 a day, and nearly 2.5 billion that live on less than \$2 a day. And while democracy has swept across developing countries like never before, the gains have slowed in recent years, and many countries still live under tyranny, dictatorship, or in the midst of conflict. Sadly, some of the world's most difficult development challenges have not yet been tackled.

The Changing Context for Development

While understanding the past is important, our real concern must be with the future of development. New forces are rapidly changing the global context for development. The development challenges facing countries today is far different than it was just 20 years ago. Future success will depend on understanding the past, but even more so in taking advantage of new opportunities and preparing to meet emerging threats and challenges. Six key dimensions of change stand out.¹²⁹

First, as outlined above, there are enormous and growing differences in performance across countries. High performing countries have an expanding middle class, higher saving rates, larger markets, more government revenue, more trained and capable workers, and more foreign investment. Some emerging markets — especially the so-called BRICs (Brazil, Russia, India, and China) are becoming some of the largest markets in the world, while the old reliable rich-country markets in Europe, the United States, and Japan are under enormous pressure. The result is a dramatic change in the global economic balance. But at the same time, other developing countries remain stuck with slow growth, little investment, stagnant revenue and saving, few new economic opportunities, and often greater conflict.

Second, democracy has expanded rapidly, especially following the end of the Cold War and the collapse of the Soviet Union. Democracy emerged in countries as diverse as South Korea, Indonesia, Poland, South Africa, Ghana, Brazil, and El Salvador. To be sure, these democracies are fragile and far from perfect, but never before have so many low-income countries attempted to become democracies in so short a time.

Third, in just 10 years between 2001 and 2010, net private capital flows to developing countries grew six-fold from less than \$200 billion to over \$1 trillion.¹³⁰

¹²⁹ For a discussion of some of these trends, see *USAID Policy Framework 2011–2015* (Washington, DC: USAID, 2011), available at <http://transition.usaid.gov/policy/USAID_PolicyFramework.PDF>.

¹³⁰ *Global Development Finance: External Debt of Developing Countries* (Washington, DC: The World Bank, 2012), available at <http://data.worldbank.org/sites/default/files/gdf_2012.pdf>.

Investors are arriving from around the world, including middle-income emerging economies such as China, India, Malaysia, Brazil, Russia, South Africa, and many others. These capital flows create some risks, but overall create huge new opportunities for job creation, skills transfer, and growth in developing countries. They now dwarf official aid flows.

Fourth, new technologies are changing the development process. Cell phones have become ubiquitous, and Internet access is growing quickly. The cost of shipping goods and moving people is far lower than it was just 20 years ago. These technologies are creating new economic opportunities, helping to deliver basic services, facilitating political debate, and improving transparency and accountability, all of which strengthen the prospects for continued progress in many low-income countries. And their influence will only grow in the years to come.

Fifth, pressures are growing from demographic trends, resource demand, and climate change. By 2050, the world's population will grow to around 10 billion people, with the fastest growth in developing countries, and more specifically, in urban areas of developing countries. Demand for critical resources, especially water, land and energy, will grow rapidly. Global demand for food and water is likely to increase by 50 percent in just the next 20 years. Climate change will only add to these challenges.

Sixth, religious and ethnic tensions are rising in many parts of the world, creating disputes and conflicts that are disrupting or, in some cases, reversing development. The tensions are obvious in Afghanistan, Pakistan, Somalia, Sudan, Iraq, and many other places. They are a major undercurrent in the still-unfolding Arab spring, and more recently have become major problems in other countries such as Mali and Egypt.

Three Scenarios for the Future of Development

With these dramatic global changes unfolding, the future for developing countries is uncertain. There are at least three forward-thinking scenarios for the future, which I will only attempt to outline broadly and stylistically.

Scenario 1: The continuation of rapid global development. The trends of the last 20 years expand and accelerate. The BRICs continue their ascendancy, with several other middle income countries following closely behinds, including Turkey, Indonesia, Thailand, South Africa, and Chile. Many low-income countries continue to expand their economies and reduce poverty, such as Ghana, Tanzania, El Salvador, the Dominican Republic, the Philippines, and Bangladesh. As more countries succeed, markets for trade grow between developing countries, allowing markets to expand regionally and beyond. Moreover, pressure grows in the countries left behind to follow the examples of

their more successful neighbors. Technologies, experiences, and ideas that succeed in one country spread easily to another. Cell phone use continues to expand, the Internet (and the opportunities it creates) makes an even bigger impact on the poorest countries, and new research leads to an expansion in agricultural productivity. Countries that have been “stuck” begin to turn around, including Cote D’Ivoire, Nigeria, and Egypt. Who would have even considered Burma as a turnaround candidate two years ago?

Along with this growth, the extraordinarily rapid advances in global health continue, with a halt in the spread of the HIV/AIDS epidemic, reductions in malaria, the extermination of polio, and the elimination of preventable childhood diseases. Global poverty rates continue to decline sharply. Democracy continues to spread — although haltingly and imperfectly — with more countries embracing accountability, transparency, and good governance. Some countries continue to stagnate, but their number becomes smaller, and they increasingly become the exception rather than the norm.

Scenario 2: Global conflict derails development. Global tensions rise sharply, either based on economic strains from the rise of Asia and decline of Europe, or based on religious or ideological frictions. Countries move into new geo-political spheres, replacing the two old Cold War spheres with blocks aligned around traditional western powers, an ascendant China, an empowered India, and a coalition of Muslim countries. Conflict in the Middle East explodes, and quickly spills over to South Asia, North Africa, and Central Asia. Economic disputes between a rising Asia and a diminishing West decay into major trade wars, and an aging and frustrated West becomes more tempted to use the threat of advanced weapons to keep others in check. Tensions within Asia rise over territorial waters and claims to undersea resources.

In short, the world goes to war. Those who think this is far-fetched need only remember that the last great era of global development, the expansion of Europe and the United States in the late 19th and early 20th centuries, ended abruptly with the descent into the first World War, followed shortly thereafter with the Great Depression and World War II. Obviously, this scenario would result in the complete derailment and reversal of global development.

Scenario 3: Increasing pressure on the planet. The combination of rising urban populations and increasing incomes puts growing pressures on water supplies, energy, demand for minerals, and air quality — challenges created in part by the recent great success of global development. Climate change undermines agricultural productivity and diminishes food supplies while global demand for food reaches an all-time high. Commodity prices rise steadily, while food prices accelerate their recent trends of both extreme volatility and steady increases. As agricultural productivity falls in many developing countries, poverty

rates halt their decline and begin to rise again. This scenario then morphs into Scenario 2. Pressure on the planet and the demand for scarce resources (such as water) lead to an explosion of conflict and the end of global development as we know it.

What Can Be Done?

It is unlikely that any of the scenarios outlined above will take place exactly as predicted. But in a broad sense they capture some of the major choices and futures that the world faces. Which will it be? What do these outcomes depend on, and what can we do to influence them? In my view, the answer depends on four broad factors: technology, connectivity, policy choices, and governance and institutions.

Technology: Thomas Malthus famously predicted that population growth would result in famine, disease, and unrelenting poverty. What Malthus overlooked — not surprisingly since he was writing in the early 19th century — was the power of technology to increase agricultural productivity, create new economic opportunities, and improve health. Today the world comfortably supports far more people with a higher standard of living and lower rates of poverty than in Malthus's day largely because of improvements in technology. From the industrial revolution to new energy sources to improvements in transportation to new vaccines to cell phones and the Internet, technology has been the key to allowing the planet to support more and more people. Consequently, investments by both private companies and governments in new agricultural technologies, health, and other areas will be central to whether the planet can continue to support a growing number of people. But developing technologies is neither automatic nor guaranteed. It will take strategic investments and creative public-private partnerships to succeed.

Connectivity: The more countries trade, share ideas, connect through the Internet, share technologies, and otherwise increase connectivity, the more the world economy grows, and the more we depend on each other for shared prosperity. The two most powerful engines for global growth since the industrial revolution have been trade and technology. Both require integration and connectivity (some might use the word globalization here, but it is an overused word that means all things to all people). The economic gains from trade are well known, but I believe trade is extremely important politically as well in terms of getting different cultures, markets, institutions, peoples, and societies engaged with each other and benefitting and learning from each other. The more that different parts of the world are integrated and connected economically, the less likely we are to have large conflicts, since we will all have too much to lose as we

are in this together. In short, trade provides everyone a growing stake to work together to find solutions to common problems. Continuing global growth and development will require increasing regional and global trade ties, including finalizing the Doha round (or something like it) and subsequent trade agreements in the future. Doing so will require deepening regional trade among developing countries, and reducing barriers to cross-border investment. It will require sharing of ideas, especially towards developing the technologies needed to address key global challenges.

Perhaps the wisest observations about this point were voiced 236 years ago by Adam Smith in *The Wealth of Nations*. He foresaw that increased trade would be the vehicle not only for raising incomes but for creating mutual respect and reduced conflict and injustice: “Hereafter...the inhabitants of all the different quarters of the world may arrive at that equality of courage and force which, by inspiring mutual fear, can alone overawe the injustice of independent nations into some sort of respect for the rights of one another. But nothing seems more likely to establish this equality of force than the mutual communication of knowledge and all sorts of improvements which an extensive commerce...carries along with it.”¹³¹ As usual, Adam Smith had it right.

Policy choices: Much of the future will depend on the policy choices that individuals, communities, and countries make in key areas. Allowing prices to move to reflect scarcity values and true costs creates powerful incentives to shift behavior. For example, removing fuel subsidies and moving towards taxes on fossil fuel use and carbon emissions is not only fiscally responsible, but will dampen the use of fossil fuels and will begin to mitigate climate change. At the same time, choices to invest in alternative fuels with a much smaller environmental footprint — gas, solar, and wind — will move in the same direction. As discussed above, investments in new agricultural, health, and energy technologies will be critical, but societies need to make the active choices to do so. Similarly, choices to invest in education, health, and family planning will help keep countries on the right path as we move towards greater global prosperity. But all of these choices require sacrifice and involve shifting away from easy, current consumption. Instead, we need to focus on making greater investments in the future.

Governance and institutions: Continuing widespread global development will require strengthening institutions and governance both nationally and internationally. The more the world moves towards accountable, transparent, inclusive, democratic institutions, the more likely we will be to continue the move towards global prosperity. The evolution of democracy has been a key force in mitigating conflict and facilitating choices that have kept the world broadly at

¹³¹ Adam Smith, *The Wealth of Nations* (London: J.M. Dent, 1910), 280.

peace and moving towards prosperity in recent decades. People need to have their voices heard and to feel that choices are being made fairly. Inclusive democracy is the best system to facilitate the debates and choices we need to make to continue global prosperity.

Democracy is far from perfect. But Winston Churchill had it right when he said “democracy is the worst form of government except all those other forms that have been tried from time to time.”¹³² The question of which causes the other — inclusive democracy or sustained growth and development — is almost beside the point. I believe the causality can and has run both ways in different countries, with each reinforcing the other. We need both. The key is to establish institutions that create leadership that is accountable and can make decisions that will benefit societies as a whole in the long run. Democracies, for all their weaknesses, are the best system we have that will help leaders make those choices.

At an international level, the key global institutions — the United Nations, World Trade Organization, International Court of Justice, World Bank, International Monetary Fund, and G-8 — were established at an earlier time in history to face different challenges in the context of a different global structure. In many ways, for all the criticism heaped upon them, they have been enormously successful in contributing to the goals for which they were established — maintaining global peace and moving the world towards shared growth and prosperity. But they must evolve quickly and responsibly to reflect both changes in the global structure and changes in the key problems we face. The balance of power and decision-making in these institutions must reflect the rise of emerging powers and relative decline of Europe. The traditional Western powers must embrace and include these rising powers in order for these countries to buy into these institutions so that they maintain their legitimacy and their ability to collectively solve major challenges. Similarly, traditional donor groups must actively reach out and include China and other rising donors to join them at the table, rather than excluding them. These global institutions must also adapt to reflect the evolution of key issues. From the Cold War, to keeping the peace after World War II, to dealing with the new economic balance of power and rising religious and ideological tensions, priorities have changed. These institutions have begun to change as well, but there is a long way to go to fully equip them, especially the United Nations, to deal effectively with the global issues that will face us in the coming decades.

Obviously, the margin of error is wide in the scenarios and recommendations listed above. No one can predict the future with precision. But thinking about these issues and about potential future scenarios helps us to individually and collectively confront and address tomorrow’s global challenges

¹³² Winston Churchill, Speech to the House of Commons, November 11, 1947, available at <<http://hansard.millbanksystems.com/commons/1947/nov/11/parliament-bill>>

and gives us the opportunity to continue fighting poverty and widening the circle of global prosperity and development.

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Princeton University
Former Director of Policy Planning, United States Department of State*

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*Executive Professor
George H. W. Bush School of Government and Public Service
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E. William Colglazier

Science and Technology Adviser to the Secretary of State