Beyond Boundaries:

The Role of the IAEA in Balancing Security and Development Priorities in the 21st Century

By Audrey Williams

November 2014

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Contents

Preface

I am pleased to present this fine study proposing some new options for member state engagement of the International Atomic Energy Agency (IAEA). It was written by Audrey Williams, who spent a year at Stimson as a Scoville Peace Fellow, under the supervision of Brian Finlay, Stimson's managing director and the director of the Managing Across Boundaries (MAB) Initiative. This study is very much in the spirit of MAB's work: to expand our understanding of the international security agenda by making conceptual and concrete linkages to other arenas of public policy—in this case, economic development for countries of the Global South.

The IAEA has been in the public theater for its pivotal role in monitoring the possibly suspect nuclear activities of a small set of the Nuclear Nonproliferation Treaty (NPT) signatories whose activities have raised suspicions of noncompliance. But its role is wider than that. Under its 1957 statute, the IAEA is mandated to facilitate the use of peaceful technology, as well as to safeguard that technology against potential proliferation to weapons programs. Nuclear technology can be and is applied to multiple important civilian uses—from medicine to agriculture to water and food security. These applications touch on many of the core developmental needs of countries of the Global South. One of the goals of this study is to improve understanding in those countries of the IAEA as a possible resource, and to encourage the IAEA to strengthen its ties to developing countries in order to enable greater cooperation and better outcomes across the full suite of IAEA goals and missions.

Stimson's work over the past quarter-century—we are now celebrating our 25th year – **has always been based on pragmatic solutions to problems of international security**. It is our hope that this latest report will provide some useful, actionable ideas for the IAEA and for its member states. We are grateful for the assistance of the Carnegie Corporation of New York, which has supported the innovative work of the MAB Initiative as well as other Stimson programs. Our conceptual work on the security-development nexus has been supported for several years by the government of Finland, and we express our appreciation for their engagement in this work. And we thank the Herbert Scoville Jr. Fellowship program, which has enabled us to host and mentor a series of outstanding young scholars.

Ellen Laipson
President and CEO

Acknowledgments

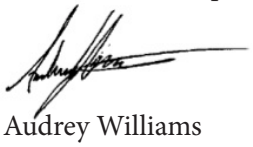
The creation of this report has been a coordinated effort among various individuals and organizations, and each has provided invaluable contributions. Stimson is grateful to the Carnegie Corporation of New York for its support of the Beyond Boundaries Initiative, and to the government of Finland, which helped pioneer the model of nonproliferation engagement described herein.

Since 2006, the MAB Initiative at the Stimson Center has been working in collaboration with a consortium of national governments, international and regional organizations, and civil society groups to address the proliferation of nuclear weapons by leveraging so-called "dual-benefit" assistance. This report is part of that initiative and seeks to provide a space for discussion on how the IAEA might be better utilized to address evolving nuclear proliferation threats in the 21st century.

One of the most concerning trends in proliferation comes from the developing world, where globalization has allowed for an increased presence of nuclear dual-use technologies, as well as the increased ability of nonstate actors to intercept those technologies. Previous Beyond Boundaries efforts have considered these trends as they impact the Caribbean, Central America, the Andean Region, Eastern Africa, the Middle East, and Southeast Asia. These studies pioneered a dual-benefit approach to nonproliferation assistance that created greater space for countries of the Global South to meet their global responsibilities while addressing other security and development concerns. The findings of this report suggest that the dual-benefit approach can be applied effectively to the IAEA's programmatic portfolio—and, to some extent, is already being applied. By focusing more deliberately upon the unique mandate and capacities of the IAEA, the international donor community can make more effective use of limited nuclear safety and security resources.

As a Herbert Scoville Jr. Peace Fellow, I had the opportunity to work with the MAB Initiative for nine months. I am honored that Director Brian Finlay and Deputy Director Johan Bergenas entrusted me with this report from day one. Their feedback has been integral not only to the final product but also to my growth as a researcher and writer. I am also grateful to Gerson Sher and Debra Decker, senior advisors at the MAB Initiative, who provided excellent feedback; to Stimson Center intern Jillian Foerster for her wonderful comments; to Dr. Lawrence Scheinman for reading early drafts; and to Dr. Andrew Semmel, whose insights helped guide my research. I thank Lita Ledesma for her exceptional design of this report.

Finally, I extend my gratitude to the board members of the Herbert Scoville Jr. Peace Fellowship, who have given me countless opportunities to grow professionally. My special thanks to Darcy Scott Martin and Kingston Reif, both of whom have been excellent mentors, and to Paul Revsine, program director of the Scoville Fellowship, who has provided exceptional guidance to class after class of Scoville Fellows.



Audrey Williams
Herbert Scoville Jr. Peace Fellow
The Stimson Center

Abbreviations

BLCTC	Brian Lara Cancer Treatment Centre
BoG	Board of Governors
CARICOM	Caribbean Community
FAO	Food and Agriculture Organization of the United Nations
IAEA	International Atomic Energy Agency
KNH	Kenyatta National Hospital
MDGs	Millennium Development Goals
PAHO	Pan American Health Organization
RANET	Response and Assistance Network
SDGs	Sustainable Development Goals
TB	Tuberculosis
TC	Technical Cooperation
Ug99	Wheat Black Stem Rust
UNSCR	UN Security Council Resolution
WHO	World Health Organization
WMD	Weapons of Mass Destruction
ZRG	Zero Real Growth [budget/budgeting]

Executive Summary

Technological innovation has revolutionized global transportation and communications infrastructure, providing a boon for trade and allowing countries across the world to develop economically with astounding speed. However, this same global interconnectedness has also provided new opportunities to transnational criminals, including traffickers and terrorists, to manipulate globalization to their own benefit. These worrisome trends present the potential for nuclear dual-use technologies to proliferate more seamlessly alongside the global flow of contraband, ranging from narcotics and human slaves to conventional arms and counterfeit goods. While states seeking weapons programs remain the central drivers of nuclear proliferation in the 21st century, nonstate actors now increasingly facilitate the proliferation of nuclear dual-use technologies.

As the international agency tasked with safeguarding nuclear technologies for peaceful uses, the IAEA must be a central actor in meeting the new proliferation challenges posed by nonstate actors. This report seeks to clarify the dual role the IAEA plays in both the safety and security of nuclear technologies, as well as in the peaceful applications of those technologies. With a mandate to "encourage and assist research on, and development and practical application of, atomic energy for peaceful uses throughout the world," the IAEA has become an important participant in global development through the application of technologies relevant to agriculture, health, water and myriad other applications directly relevant to the health and welfare of global citizenry.

The trend of nuclear dual-use technology proliferation among nonstate actors plays out with particular concern in the Global South. Globalization has made it possible for developing countries to serve as the originating, transshipment and end-user points on the global nuclear supply chain. The increasing presence of nuclear dual-use technologies and materials in the developing world has created a new set of nonproliferation responsibilities for these countries. Yet despite the importance of nonproliferation initiatives, these countries face other considerable, conventional security and development challenges that require time and resources. In many cases, developing countries lack the political and financial capital as well as the capacity to adequately address new proliferation trends within their borders.

For these countries, identifying the points of intersection between hard security and soft security concerns is central to developing initiatives that can address core concerns while meeting international nonproliferation obligations. In a world that is interconnected, security threats and development challenges also intersect. Hard security concerns (such as global terrorism and proliferation of weapons of mass destruction, or WMD) exacerbate soft security concerns (such as illicit trafficking and poor public health). Despite the fact that security and development are mutually supportive—secure societies have greater space to develop, while improved development cuts down on security threats—national policies aimed at addressing interconnected security threats and development challenges often remain isolated from each other. This is particularly true among donor states, where resources are stratified and often poorly coordinated across the breadth of foreign aid priorities. And although hybrid threats require hybrid solutions, many government approaches to security and development across the world still prioritize one over the other.

Under its 1957 statute, the IAEA is mandated not only to facilitate the use of peaceful technology to meet development challenges but also to safeguard that technology against potential proliferation to weapons programs. Despite the IAEA's balance between these responsibilities, misperceptions among its member states have led to an unbalanced view that emphasizes the IAEA's safeguard activities over all others.

For some of the IAEA's member states in the Global North, the various challenges of underdevelopment are no longer present concerns. These countries may now have the luxury to orient their political and financial

capital toward nonproliferation initiatives. Yet for the majority of the IAEA's member states, development issues such as fragile food security and overstretched cancer care systems remain considerable challenges. For these countries, the IAEA offers the boon of peaceful nuclear technology through its Technical Cooperation (TC) program. Nevertheless, the IAEA's TC activities often generate contentious debate among member states. Some developed countries are concerned that TC projects present the possibility for proliferation; some developing countries see such worries as efforts to deny them peaceful nuclear technology. The result is an agency beholden to the misunderstandings among its member states.

The ability of the IAEA to address proliferation trends in the Global South will depend on how effectively the agency and the international community can overcome these misunderstandings to bring developing countries more fully into the global nonproliferation regime. Given that the IAEA's TC program provides the clearest and most immediate impetus for developing countries to engage with the agency, future TC projects should be advanced in such a way as to help developing countries meet both their development goals and their nonproliferation responsibilities. In order to achieve this goal, two major challenges must be confronted: limited sources of funding for the TC program, and misperceptions among member states of the IAEA's essential role in providing development cooperation based on peaceful nuclear technology.

Both challenges can be addressed best through a dual-benefit approach that ensures that all IAEA member states are able to address their security and development priorities. Such an approach hinges upon innovative public-private partnerships that leverage expertise across government, industry and civil society. Where security threats and development challenges intersect to affect entire societies, only whole-society approaches can present viable solutions. Thus, actors across the public and private sectors have unique roles to play in addressing the security threats and development challenges of the 21st century. Such public-private partnerships will require efforts on the part of the IAEA, member state governments, and industry and civil society in order to:

- leverage indigenous expertise among industry and civil society actors through public-private partnerships to address shortages of funding and capacity for TC projects;
- identify nontraditional resource streams so as to go beyond making efficient use of existing funds and instead generate additional funds for the TC program;
- enlist actors from across industry, civil society and country governments to help IAEA member states develop more comprehensive, sustainable and proliferation-resistant TC projects;
- strengthen channels of communication between the IAEA and its member states in order to create space for conducive discussions on the mutually supportive nature of security and development; and
- create media and public outreach initiatives that allow for a more balanced narrative concerning the IAEA's nonproliferation and development roles.

By enlisting the support of actors across society, as well as countries across the developed and developing world, the dual-benefit approach can ensure that the TC program remains proliferation-resistant, while also providing sustainable and successful developmental support to countries across the developing world.

Project Report

Nuclear Proliferation in the 21st Century

Even as the first atomic bombs were dropped on Hiroshima and Nagasaki, scientific innovation was beginning to reveal the promise of nuclear technology for development in fields like medicine, agriculture and energy production. The destructive power of nuclear energy combined with its developmental potential presented world leaders with an "atomic dilemma": nuclear technology could either advance human society or devastate it. US President Dwight D. Eisenhower set out to address this dilemma when he presented his "Atoms for Peace" speech at the UN General Assembly in 1953. The speech rested upon the understanding "that if a danger exists in the world, it is a danger shared by all; and equally, that if hope exists in the mind of one nation, that hope should be shared by all."[1] World leaders recognized that a new era was beginning to take shape, an era in which global security would determine national security and each nation's security would have profound effects on the peace and prosperity of the world as a whole.

By 1953, technological innovations were already beginning to lay the foundations of a globalized international system, one in which both successes and failures were eventually circulated to and through every nation. Throughout the late 20th century and into the 21st, global interconnectedness has become increasingly sophisticated and entrenched in the fabric of modern society. Innovations in global trade—including foreign direct investment and the freer flow of goods, services, information and money—have yielded inexorable growth worldwide. Yet while globalization has given countries new hopes for development, the same forces that trade in triumphs also facilitate an underbelly of criminality.

The freer flow of goods has boosted industry, but it has also aided actors seeking to strengthen illicit trade. Arms, laundered money, counterfeit goods, drugs and humans (both willing and unwilling) travel through illicit networks established on the margins of the legitimate economy. Globalization has strengthened nonstate actors (entrepreneurs, businesses, NGOs) seeking to do global good, but it has also empowered other nonstate actors (criminals, terrorists, traffickers) whose pursuits are inherently destabilizing and destructive.

Whereas once only states had the ability to threaten global security, that power is now also found in the hands of nonstate actors. While some have proven adept at causing chaos with conventional arms, their empowerment is particularly troubling given that the rise of the nonstate actor coincides with a growing accessibility to weapons of mass destruction. The interconnected nature of global trade allows nuclear dual-use technologies to pass through transit hubs in developing countries with greater frequency than ever before. Additionally, the advent of the technology and information age coupled with the dynamics of globalization have given developing countries the capacity to serve as origin points for nuclear dual-use technologies. These developing countries are themselves increasingly turning to nuclear technology to meet their energy and development objectives. Yet while developing countries have become new originating, transit and end-user points for nuclear dual-use technologies, many still lack the financial and human resources needed to ensure that those nuclear technologies and materials remain safe and secure. Nonstate actors are already manipulating gaps in security and regulation to facilitate the proliferation of nuclear technologies to states with weapons programs. In the late 20th and early 21st centuries, Pakistani scientist Abdul Qadeer Khan used the classified knowledge he gained working for URENCO Group in the Netherlands not only to help Pakistan build its nuclear weapons program but also to aid other countries in the pursuit of nuclear weapons. The revelation of the A.Q. Khan network in 2004 has highlighted the dire state of illicit smuggling in nuclear dual-use technologies and materials. Even more troubling than nonstate actor facilitation of illicit nuclear trade is the fact that some nonstate actors have expressed nuclear ambitions of their own.

The A.Q. Khan network has proven that, beginning in the late 20th century, nonstate actors have increasingly become essential to nuclear proliferation in a globalized world where state institutions are bound by a more robust international nonproliferation regime. While the state still plays a primary role in nuclear proliferation, the rise of the nonstate actor has upended traditional patterns in technology acquisition.[2] As the international agency tasked with safeguarding nuclear technologies for peaceful uses, the IAEA must be a central actor in meeting the new proliferation challenges posed by nonstate actors. While preventing state proliferation will continue to be an essential objective for the IAEA in the 21st century, the question of how to address nonstate actors who facilitate proliferation will be essential to determining how the IAEA continues to evolve beyond its Cold War origins to address modern proliferation threats. In this effort, new proliferation trends in the developing world present a difficult and pressing challenge.

The IAEA in the 21st Century

The International Atomic Energy Agency's (IAEA's) relationships with the developing world rest on a strong foundation rooted in the origins of the organization. When the IAEA was established in 1957, world leaders granted the agency the responsibility to "seek to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world" while ensuring "that assistance provided by it or at its request or under its supervision or control is not used in such a way as to further any military purpose."[3] The IAEA was created to address the atomic dilemma by ensuring that the advancement potential of nuclear technology could be realized in a manner that also prevented its military use.[4] It is the first part of this mandate that has allowed the IAEA to establish relationships with countries of the developing world. The peaceful use of nuclear technology has allowed member states to meet their development needs through the use of nuclear techniques to improve agricultural and medical practices as well as to generate electricity.

In the IAEA's mandate, development and nuclear nonproliferation go hand in hand. The peaceful use of nuclear technology can only be ensured through the application of standards for safeguards, safety and security. Yet in practice and in perception, these two inextricable functions have been funneled into separate "stovepipes." Since the IAEA was founded, developing countries have "seen the Agency's prime value as a provider of technical assistance in the peaceful use of nuclear technology."[5] However, developed countries—able to seek the benefits of peaceful nuclear technology without the assistance of the IAEA—emphasize "the Agency's role in preventing the proliferation of nuclear weapons and ensuring the safety and security of peaceful nuclear activities."[6]

The IAEA's "general internal and external image [remains] that of the 'Nuclear Watchdog,'"[7] with its safeguards, safety and security activities emphasized over its development and implementation of peaceful uses of nuclear technology. For developed countries, this emphasis reflects the importance of preventing the proliferation of nuclear weapons and of securing existing nuclear technology and materials. However, for developing countries that benefit directly from the application of peaceful nuclear technology through the IAEA's Technical Cooperation (TC) program, an overemphasis on the IAEA's watchdog role is seen as obscuring the primary reasons for which the developing world engages with the IAEA, and endangering development potential.

Some member states do engage across the entire IAEA mandate. The United States is the single largest contributor of funds to the IAEA's TC program; in 2012 alone, the United States paid 15,350,985 euros to the Technical Cooperation Fund.[8] Member states across the developed and developing world alike are expected to negotiate safeguard agreements with the IAEA and are encouraged to keep them updated.[9] Additionally, the latest *Technical Cooperation Report* (2013) documents an increasing number of projects focused on improving the safety and security of nuclear and radiological materials in the developing world, showing increased awareness among developing countries of the importance of nuclear safety and security.[10]

The IAEA will be better able to meet its 21st-century security and development priorities if its member states can rebalance their perceptions of the IAEA's mandate. As Trevor Findlay noted in his 2012 report on reforming the IAEA, this will require member states from across the developed and developing world to compromise, which will necessitate an understanding of both developing-country sensitivities surrounding the provision of peaceful nuclear technology and developed-country worries regarding the proliferation of said technology to weapons programs.[11] In order for the IAEA to properly meet the proliferation challenges of the 21st century, the entire international community has a responsibility toward correcting unbalanced perceptions of security and development priorities writ large.

The same lack of balance that is harming the IAEA's potential is playing out on the global stage. While Cold War security threats dominated the concerns of policymakers in the Global North during the latter half of the 20th century, developed countries have prioritized security issues to an even greater extent in the aftermath of 9/11. For developing countries, however, prioritizing policies aimed at combating terrorism, illicit trafficking and WMD proliferation can be a more complicated endeavor, as entrenched development challenges—such as poor public health, widespread poverty and fragile food and water security—place equally pressing demands on limited time and resources. While globalization has linked international security threats together in a way that makes every country a stakeholder, for many states some threats and challenges are far more immediate than others. For example, although a WMD terrorist event would have disastrous consequences for all nations, the image of a terrorist wielding a gun or a conventional explosive is still much easier to envision for much of the world's population, especially in the Global South.

Development challenges also present a more daunting and pervasive threat in the short term. Even when political actors in developing countries are sensitized to the very real dangers and consequences of a WMD terrorist event, political will alone cannot overcome basic shortfalls in capacity. Without the proper resources, governments in the developing world simply cannot adequately address WMD proliferation, other security threats and development challenges at the same time.

Actors across the international community are beginning to recognize the need to rebalance security and development policies in order to address realities on the ground, where security threats and development challenges are interconnected.[12] With regard to the IAEA, this recognition means increasing international awareness of its development activities. In a 2011 audit, the external auditor suggested that "the Agency should consider itself to be a development organization and act as such," based on the fact that the IAEA "spends more than half its budget on Official Development Assistance."[13] Actors within the IAEA (particularly the leadership) are actively working to rebalance internal and external perceptions to better account for the IAEA's broad portfolio spanning nonproliferation, safety and security, and development.

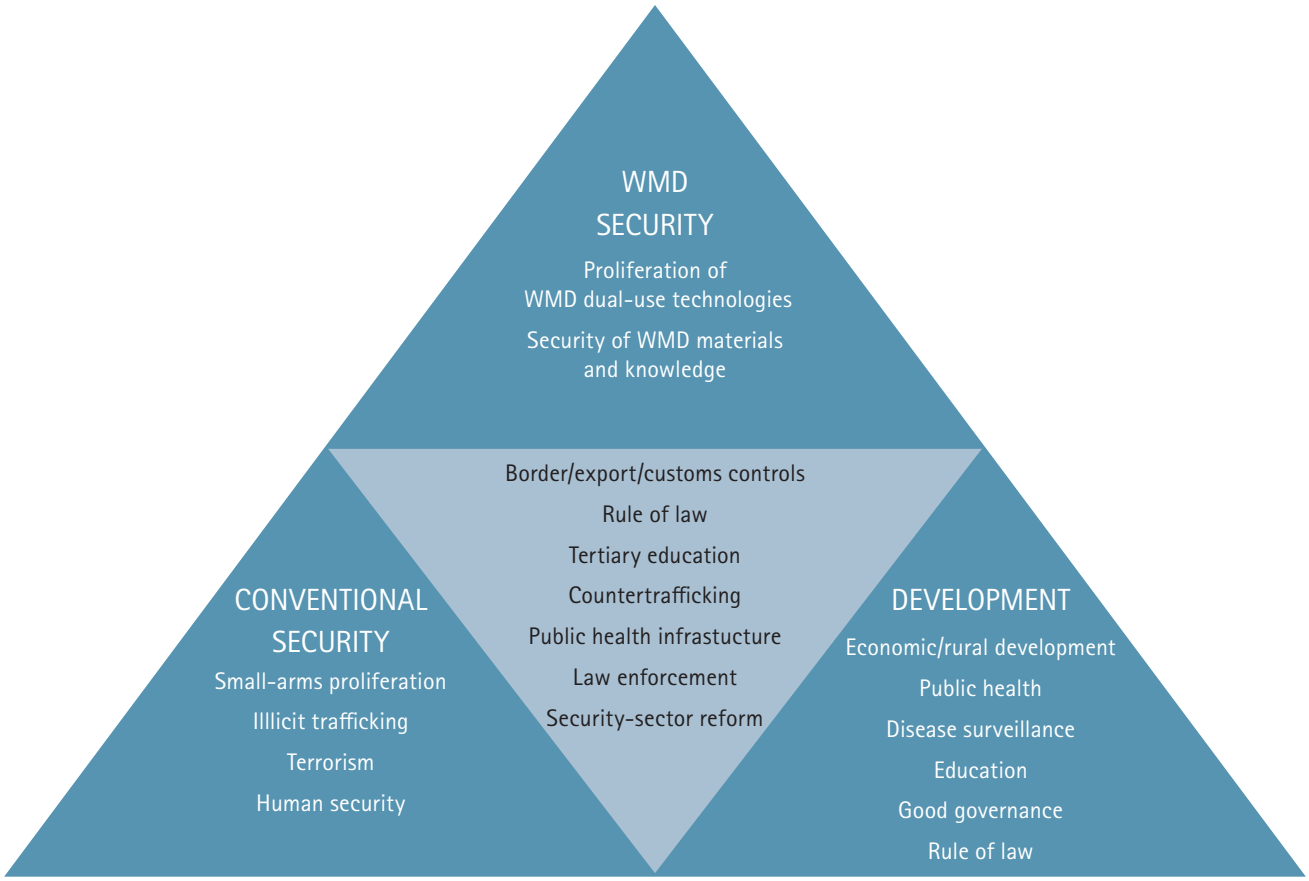
Since beginning his first term in 2009, IAEA Director General Yukiya Amano has taken steps to reframe the public's perception of the IAEA. Within the IAEA's TC portfolio for 2010-2011, Amano prioritized the improvement of cancer treatment and facilities in developing countries.[14] Amano has also emphasized the IAEA's "unique" role as a stakeholder in the achievement of the United Nations Millennium Development Goals (MDGs).[15] The IAEA's development of advanced nuclear techniques and implementation of those techniques through the TC program contribute directly to the MDGs, especially those covering poverty and hunger, environmental sustainability and public health.[16] Given the IAEA's previous contributions to the MDGs, it currently serves as a member of the United Nations System Task Team on the post-2015 UN development agenda. As the team works toward a new set of sustainable development goals (SDGs) to follow the MDGs when they end in 2015, the IAEA is using its role to emphasize "the importance of including strong national science, technology and innovation institutions in the new SDG framework."[17] Until the framework is determined, the IAEA will continue to incorporate the MDGs into its TC activities.

The Dual-Benefit Approach and the IAEA

In the immediate years after the UN Security Council passed resolutions 1373 (2001) and 1540 (2004)—aimed at reducing support for terrorist groups and preventing nuclear terrorism, respectively—the implementation of both mandates lagged in the developing world, especially in the case of UN Security Council Resolution (UNSCR) 1540. The lack of capacity and resources to meet both pressing security and development concerns was a significant contributing factor in the failure to secure widespread implementation across the developing world. In many regions, development issues and related soft security issues were greater priorities than preventing nuclear terrorism.

However, when the security assistance provided under UNSCR 1373 and 1540 was used to address concerns about the security of small arms and light weapons as well as development challenges, countries in the Global South were able to identify the national buy-in needed to implement the resolutions. For example, initiatives that reduce the activity of illicit markets (such as export controls) not only eradicate the networks through which WMD can flow but also address the trafficking of drugs, small arms and light weapons, and humans. The programs that improve security[18] at storage sites for WMD material and technology can also be applied to other perimeters that require better security—whether those perimeters are the grounds that circle a shopping mall or the borders that create a country. This dual-benefit approach to the implementation of UNSCR 1540 has achieved considerable success throughout the Global South.[19] Figure 1 illustrates how WMD security, conventional security, and development activities intersect under the dual-benefit approach.

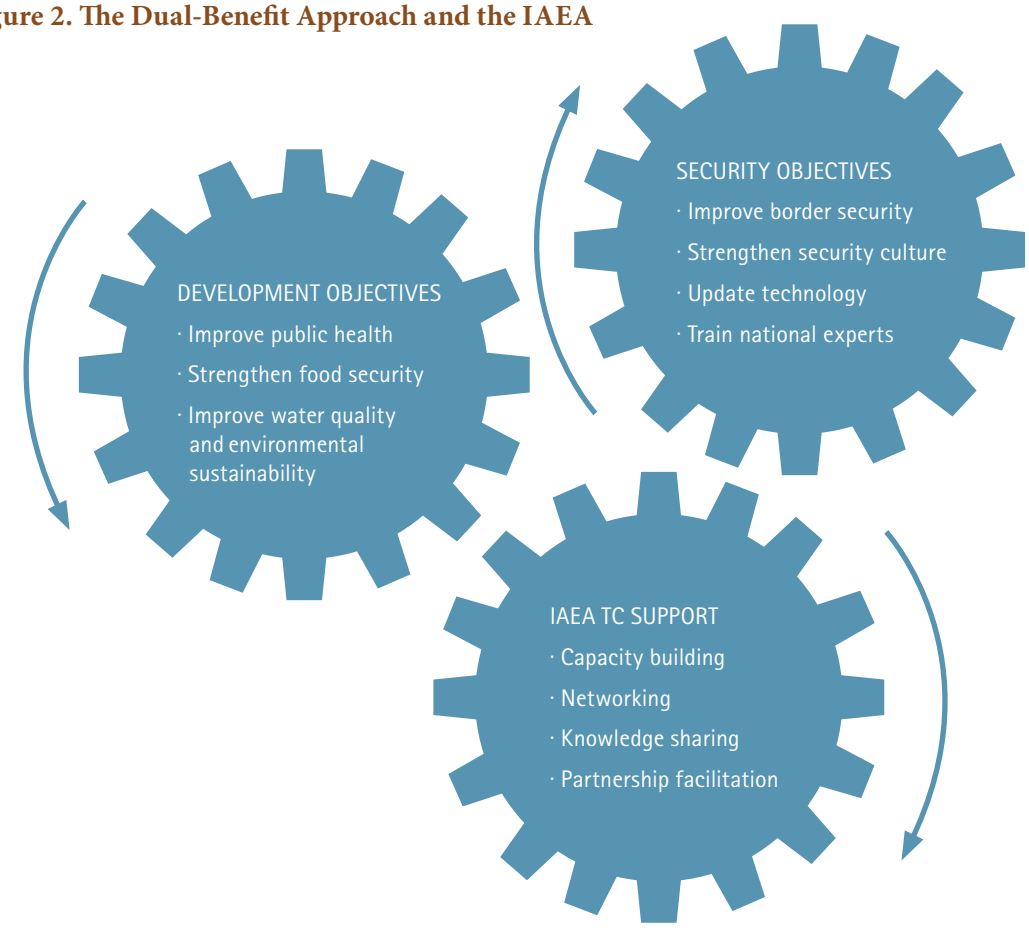
Figure 1. The Dual-Benefit Approach to Security and Development Challenges



As an organization that possesses the mandate to facilitate the peaceful use of nuclear technology and to secure and safeguard that technology against proliferation, the IAEA is a natural fit to apply the dual-benefit approach to security and development priorities around the globe. Through this approach, a variety of stakeholders from across the public and private sectors form innovative partnerships, which allow actors to develop policies that address security challenges and development needs in the same conversation. This approach emphasizes collaboration between governments, industry and businesses, and civil society organizations. In a globalized society, all actors have a stake in security and development—and thus all actors have a role to play in improving security and development. These partnerships allow actors to find new sources of revenue and expertise; for example, by tapping into traditional streams of security assistance in order to implement strategies that address both security and development concerns. Identifying innovative ways to use existing resource streams is especially crucial during a global recession.

When applied by the IAEA and the international community (including member states) to the IAEA's own activities, the dual-benefit approach could be an effective tool toward preparing the IAEA to address the evolving proliferation trends of the 21st century. Thanks to its partnerships with member states in both the Global North and the Global South, the IAEA can help to enhance communication between developed and developing countries. These conversations can lead to sustainable security and development cooperation, and mutually support the entirety of the IAEA's security and development activities. As Figure 2 illustrates, the IAEA's TC program can serve as the foundation upon which the dual-benefit approach can be implemented. The thematic functions of the TC program address both security and development concerns, and thus it is through TC activities that the IAEA will best be able to bring the developing world more fully into the global nonproliferation regime.

Figure 2. The Dual-Benefit Approach and the IAEA



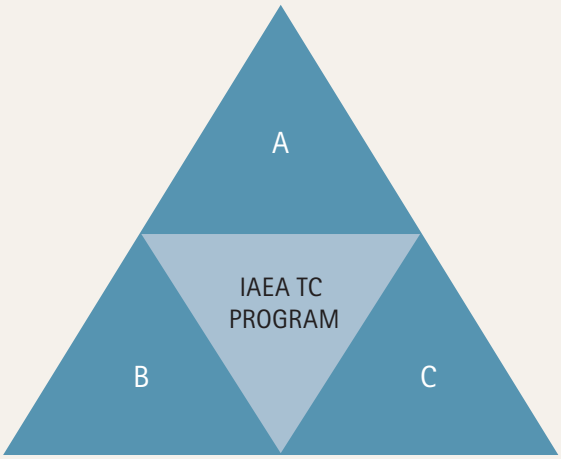
IAEA Technical Cooperation: Building a Security Conversation in Developing Countries

The Technical Cooperation (TC) program[20] at the IAEA serves two overarching functions: 1) providing nuclear-related technology, training and information to countries seeking to meet their development needs, and 2) ensuring the safety and security of the aforementioned technology, training and information. Developing countries are the main recipients of IAEA TC projects. Given the established TC-based relationships between developing countries and the IAEA, the IAEA is the actor best poised to help bring the developing world in line with global nonproliferation norms and best practices.

The IAEA implements TC projects in four regions: Africa, Asia and the Pacific, Europe, and Latin America and the Caribbean. While many participating nations pursue national projects unique to their specific needs and agendas, the TC program also arranges regional projects in order to "leverage the differences among member states in the same region by facilitating cooperation between them."[21] This approach is built upon the realization that development and security issues do not respect borders, and can affect multiple countries—if not entire regions—simultaneously. Intraregional cooperation allows the more technically advanced countries in a region to use their capacity to assist their neighbors. The geographic, historical and developmental proximity between these countries can create more sustainable engagement—and thus more enduring partnerships. The IAEA also carries out a small number of interregional projects to facilitate global partnerships across all of the world's regions.

Since the majority of the IAEA's TC projects address issue areas where the IAEA does not have the lead UN mandate (such as human health, food and agriculture, and water and the environment), the IAEA engages in cooperative partnerships with the multilateral organizations across the UN system and beyond that take the lead on these issues.[22] For example, the IAEA's partnership with the Food and Agriculture Organization (FAO) has evolved into a Joint FAO/IAEA Programme to develop and implement nuclear technologies that address global issues related to food and agriculture. The IAEA also partners with the World Health Organization (WHO) and one of its regional offices, the Pan American Health Organization (PAHO), to carry out activities that use nuclear technology to improve human health. Figure 3 illustrates the themes and regions covered by the TC program, as well as some of the services offered by the IAEA that can be applied to TC projects.

Figure 3. The IAEA Technical Cooperation Program: Themes, Services and Regions



A. Health and Nutrition, Food and Agriculture, Water and the Environment, Sustainable Energy, Radiation Technology, Safety and Security, Nuclear Knowledge Development/Management

B. Europe, Latin American and the Caribbean Asia and the Pacific, Africa

C. Training, Peer Review, Legislative Assistance, Needs Assessment, Technical Advice, Equipment Support, Knowledge Networking, Technical Publications

The IAEA's TC activities span a range of themes: agriculture and food security, water and the environment, human health, sustainable energy, radiation technology, safety and security, and nuclear knowledge development and management. Each of these activities seeks to use nuclear technology to address a variety of development challenges.

Agriculture and Food Security

The most basic and immediate need of communities around the globe is consistent access to quality sources of food and water. The global population is expected to reach 9 billion in 2050, and yet the world's current agricultural activities are already failing to provide the amount and quality of food necessary to feed every mouth.[23] In order to improve agriculture and food security, the IAEA uses isotopic and molecular techniques and methods to improve soil and livestock productivity, as well as to develop crop varieties that display higher nutritional quality and/or can withstand adverse conditions such as drought.[24]

Water Security and Environmental Health

According to UN Water, 783 million people lack access to clean water.[25] Many regions across the world –from the western portion of central and southern North America to much of northern Africa to nearly all of eastern, central and southern Asia—face a moderate to high level of water scarcity.[26] To improve water security and environmental health, the IAEA uses isotopic techniques to manage groundwater, conserve soil and water sources, monitor and protect oceans, address air contaminants, improve crop production and monitor pesticides in soil, water and farm produce.[27]

Human Health

Lack of access to adequate food and quality water sources creates a foundation for poor public health conditions. Lack of access to adequate, affordable and effective health care ensures that even treatable and curable diseases like malaria and tuberculosis (TB) plague vulnerable populations, leading to the stunted economic and developmental progress of countries in the Global South.[28] Diseases such as cancer present an additional and even more daunting challenge to the ill-equipped public health systems of developing countries.[29] To improve human health, the IAEA implements TC projects that apply nuclear technology and techniques to the prevention, detection and treatment of diseases.[30] The IAEA's health activities focus extensively on the application of nuclear medicine to controlling and treating cancer. Many developing countries lack the capacity to handle cancer at all phases, from prevention to detection to treatment. Isotopic techniques can also help prevent diseases like malaria and TB as well as monitor the effectiveness of certain medicines.

Sustainable Energy

A well-functioning, comprehensive public health system relies on consistent access to electricity, especially those components of the system that require advanced and complex technology (such as cancer control units). A consistent supply of electricity is also necessary for the operations that produce food and generate clean, sanitized water. The fluctuating availability and prices of fossil fuels combined with their adverse environmental impacts have led to increasing global exploration of and demand for alternative energy sources. Many of these efforts are focused on acquiring renewable and nuclear energy. The IAEA is an essential partner in developing sustainable energy. Through its TC program and its Department of Nuclear Energy, the IAEA can help countries assess the best possible locations for nuclear plants; can help countries procure related equipment and technology; and can build capacity through trainings and workshops. Through its food, agriculture, water and environment activities, the TC program also helps countries seeking hydropower and biofuels to manage existing resources so that the use of these resources for energy production does not exacerbate food and water insecurity and thus destabilize human health and security as well as developmental progress.[31]

Radiation Technology

The increasing use of nuclear technology and materials in the developing world—especially as a growing number of governments consider nuclear power—necessitates a more nuanced understanding of the radiation technology used to meet a variety of development needs in IAEA member states. Many TC projects require radiation technology for either the processing or analysis of materials. Some applications of radiation technology include radiopharmaceutical production, radio-analytical services, industrial methodologies,[32] and environmental applications.[33] A particularly important service of the IAEA's radiation technology work is the training of sizable pools of nuclear scientists.

Safety and Security

As developing countries seek to apply nuclear technologies to their various needs, sustainability is not the only issue in reaping long-term benefits from TC projects. Accidents involving nuclear technology can wreak havoc on human and environmental health, while the dual-use nature of the technology makes it prone to proliferation by actors seeking to apply it to military purposes. For these reasons, the safety and security of nuclear technologies and materials is key to ensuring that the activities carried out by the IAEA benefits countries rather than harms them. Thus, the IAEA TC program carries out projects focused on improving physical safety and security at nuclear sites. This endeavor includes the provision of proper equipment as well as the training of on-site personnel. TC projects also help countries build up the national safety and security regulations needed to ensure uniform standards at the country's various nuclear and radiological sites, whether these are laboratories, power plants or hospitals. Some TC projects help to build a safety and security culture among the experts and other personnel who interact with and handle nuclear materials and technology.[34]

Nuclear Knowledge Development and Management

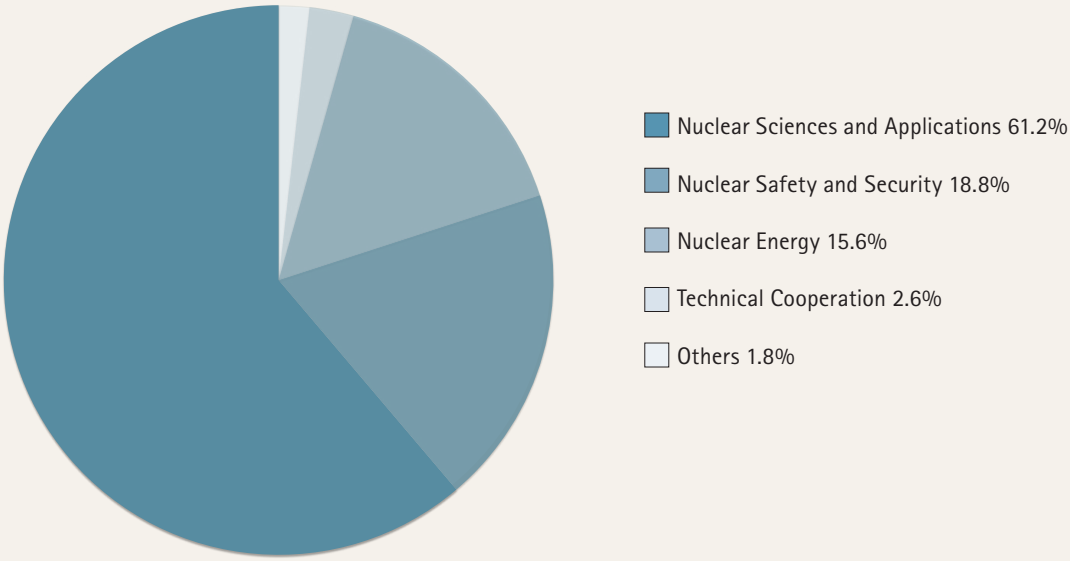
Implementing advanced nuclear technology and successfully carrying out nuclear techniques requires sophisticated and sustainable nuclear knowledge and management of that knowledge. Nuclear knowledge management is a special subprogram at the IAEA dedicated to helping member states build up nuclear knowledge structures that generate effective methodologies and guidance documents, provide training and education, and ensure the preservation of existing and future nuclear knowledge related to the country's nuclear technology and activities.[35] The TC program draws on the IAEA's nuclear knowledge management expertise to implement TC projects that help member states develop and manage indigenous nuclear knowledge. Projects are aimed at improving the capacity of nuclear institutions and training researchers and scientists, maintenance professionals, human resources professionals, management professionals and others.[36]

It is important to note that while the TC program is carried out in part under a department dedicated solely to its activities, at its core it is a multidisciplinary program, in which the IAEA's other departments provide the technical expertise required to implement the TC projects.[37] To that extent, the activities of the IAEA are institutionally integrated, even if there are occasional challenges in coordinating internal efforts across administrative stovepipes. Figure 4 illustrates the support for TC projects within the IAEA's individual departments.

Using TC Projects to Rebalance Security and Development Priorities

A key consideration of the IAEA when developing a TC project is that the nuclear technology being applied to a certain issue (whether it be cancer control or agricultural improvement, marine environment monitoring or water quality assessment) must present an advantage over the conventional methods used to approach the targeted development challenge.[39] The most important consideration, however, is that the project as proposed will contribute to the peaceful use of nuclear technology and energy, while bringing countries of the developing world more fully into the global nonproliferation regime.

Figure 4. IAEA Departmental Support to the Technical Cooperation Program[38] (as a percentage of total number of projects)



Member states are primarily in charge of choosing the projects they wish to pursue, and thus they tend to focus on projects and activities that best fit their priorities. New trends across the countries engaging in TC projects show the beginnings of a rebalancing of security and development priorities. According to the IAEA's most recent *Technical Cooperation Report* (2013), projects supporting the improvement of safety and security now account for 22.8 percent of all TC projects, the second-highest proportion behind health and nutrition (28.6 percent of all projects).[40]

In order for developing countries to engage more actively with the IAEA's nonproliferation mandate, the next step will be to build upon increasing attention to nuclear safety and security across the developing world to create sustainable awareness of the role that developing countries have to play in ensuring global safety, security and nonproliferation of nuclear dual-use technologies. In combination, increased awareness of safety, security and nonproliferation in the developing world must be paired with efforts to increase awareness of the additional development and security challenges faced by developing countries. The best strategy may be to develop TC projects that can be adapted to simultaneously address additional challenges alongside nuclear concerns. For example, a nuclear security project that improves the security culture at a hospital with radiotherapy units can serve as a model to improve security cultures at other sites, such as facilities that handle dangerous pathogens like the Ebola virus and anthrax. Finally, while IAEA expertise is considerable, its resources are limited. Developing countries will need the capacity to improve security, and, through partnerships with the IAEA, actors from across the international community can contribute additional expertise and technologies to ensure that developing countries can achieve this capacity.

The following country studies provide examples of how existing and new IAEA relationships based on technical cooperation can help bring developing countries into the nonproliferation regime.

Country Studies

Opportunities exist for the IAEA to bring developing countries more fully into the nonproliferation conversation. As a way to explore these opportunities, this report presents case studies of two current IAEA member states: Kenya, and Trinidad and Tobago.

Kenya is a member state that exhibits robust engagement with the IAEA through its TC program. It is also an emerging leader in its region. Kenya's government has begun implementing new development initiatives in recent years. However, security concerns within Kenya's borders and among its neighbors threaten the country's progress. Eastern Africa is a hub of trade—both licit and illicit. Terrorist groups such as al-Shabaab and the Lord's Resistance Army are active participants in the illicit networks of Eastern Africa. As Kenya and its neighboring countries increasingly use nuclear techniques and knowledge to meet development needs, efforts will need to be taken to ensure that malicious actors cannot target peaceful nuclear activities in the region. Kenya could serve as an ideal partner with the IAEA to begin translating its TC-based relationship into further engagement with the IAEA's nonproliferation activities—and with the global nonproliferation regime as a whole.

Trinidad and Tobago only recently joined the IAEA, and thus its engagement with the TC program will likely grow over the coming years. Trinidad and Tobago's relatively blank slate serves as an opportunity to build up a TC relationship that provides an ideal foundation for seamlessly coordinating security and development activities into a dual-benefit approach. During and after this process, Trinidad and Tobago could serve as a partner for its neighbors in the Caribbean region. Many Caribbean countries are still developing, and the illicit trade networks flowing alongside the licit trade transiting through the region negatively affect the region as a whole. Trinidad and Tobago could also serve as a partner and leader for countries across the world—particularly small island nations—that have not yet joined the IAEA as a result of misperceptions of the IAEA's objectives, services and activities.

Eastern Africa: Kenya

Development Challenges and Current Engagement with the IAEA

Kenya is fast becoming Eastern Africa's hub of tourism and trade. As such, the Kenyan government recently developed Kenya Vision 2030, an extensive and comprehensive platform for a wide range of development initiatives that aim to sustain a process of industrialization that will make Kenya into a middle-income country.[41] The program is characterized by three pillars—economic, social and political—as well as a variety of enabling and macro-level factors.

Despite Kenya's growth over the past few years, the country is still plagued by a variety of development challenges, such as lack of food security, unreliable sources of electricity, and a weak public health system. The majority of Kenya's population (more than three-quarters) lives in rural areas, where agriculture is the main source of income. Many of the poorest live in the central and western regions of the country, on lands that have a medium-to-high potential for agricultural yield.[42] For these reasons, improved food security is an essential component of Kenya's development potential, and thus is an immediate concern for the Kenyan government. Environmental degradation—soil erosion, poor water management, low soil fertility and land degradation—threaten the livelihoods of a majority of Kenya's population, and threaten the viability and strength of Kenya's economy.[43]

Kenya is one of the most populated countries in Africa, with its overstretched health system addressing more than 43 million people.[44] As in other countries across the globe, cancer rates are on the rise in Kenya; however, the country's facilities are woefully inadequate, unable to meet the needs of its own population. Nearly 80 percent of cancer patients seeking treatment at Kenyatta National Hospital (KNH), which is the only hospital in the country with a comprehensive public radiotherapy unit, are at a late stage of cancer and cannot be cured.[45] Improving cancer care is even more difficult considering that public health capacity is unable to adequately prevent and treat even easily curable diseases such as malaria.[46] Another exacerbating factor is the flood of counterfeit pharmaceuticals into Kenya, which can include medicines for easily treatable diseases as well as chronic diseases.[47]

As Kenya continues to develop, its electricity needs will vastly increase. Currently, only a fraction of Kenya's population (2 million of more than 40 million) has access to electricity. The national utility Kenya Power aims to ensure that at least 50 percent of Kenyans will have electricity by 2030.[48] Without a sustained effort to improve Kenya's electricity outputs and connectivity, its development goals will fall short. As a result of these electricity needs, Kenya has embarked on a concrete push to consider nuclear energy.[49]

In order to meet its development goals, Kenya has increasingly turned toward the IAEA for guidance. To improve agricultural yield, Kenya is involved in an interregional TC project using induced mutation techniques to develop wheat varieties that are resistant to wheat black stem rust (Ug99).[50] To address inadequate cancer control, Kenya is involved in an ongoing TC project that has upgraded existing radiotherapy centers, expanded radiotherapy services to more locations, and created in-country training programs for cancer control professionals.[51] Kenya has taken a series of recent steps to explore nuclear energy options, including the establishment of the Kenya Nuclear Electricity Board, the submission of a draft atomic energy bill to the IAEA for review and input, and the implementation of a pre-feasibility study in line with the IAEA milestone approach.[52]

Bringing Kenya into the Nonproliferation Conversation

Kenya currently has a robust relationship with the IAEA based on the IAEA's TC activities. Kenya has expressed recognition of the importance of IAEA efforts to enhance the security of nuclear materials and technologies.[53] By carrying out more safety- and security-focused TC projects in the country, the IAEA could begin the work of incorporating Kenya into its nonproliferation mandate. In 2013, 16.3 percent of Africa's TC projects fell under safety and security.[54] Using these projects as a point for inspiration, Kenya could develop national projects focused on improving the safety and security of its existing nuclear technologies and sites.

The capacities needed to improve physical security and nuclear sites could then be applied to other boundaries and borders. The IAEA assists states in developing adequate border-monitoring capabilities to detect the trafficking of nuclear dual-use technologies and materials.[55] These border-monitoring capabilities would not only help improve Kenya's nuclear security but also could be adapted to strengthen the country's ability to detect and prevent the trafficking of other commodities such as drugs, counterfeit pharmaceuticals and wildlife.

While IAEA officials help in the development of TC projects, national governments choose projects according to their priorities. Increasing the number of nuclear security projects will not occur without prioritization of these projects by the Kenyan government. The wider international community—including not just governments and multilateral organizations but also industry, NGOs, academia and civil society—could leverage the successes of the dual-benefit approach to nonproliferation so as to articulate the importance of the IAEA's technical cooperation on nuclear security. The international community can also work with the Kenyan government to ensure that future nuclear safety and security TC projects can also address Kenya's soft security and development challenges.

The Caribbean: Trinidad and Tobago

Development Challenges and Current Engagement with the IAEA

Trinidad and Tobago is a high-income country with high human development.[56] Nonetheless, a country that has achieved a high level of development can still face development challenges, and for Trinidad and Tobago one recent challenge took the form of a radiation accident. In April 2009, the Brian Lara Cancer Treatment Centre (BLCTC) decided to forgo an annual quality assurance series of tests. In that same month, the PAHO and the IAEA alerted the BLCTC that a possible radiation overdose of some 14 percent had occurred at the facility. The BLCTC ignored these warnings, and over the course of the next 18 months approximately 223

patients were exposed to radiation overdoses, a fact that was not discovered until an audit was performed in April 2010. This audit noted a "lack of local regulations governing radiation control, quality assurance and machine calibration of X-ray generators, cobalt 60 and other radiation producing devices."[57] By mid-2012, 91 (40.8 percent) of the exposed patients had died.[58]

In February 2012, the IAEA sent a Response and Assistance Network (RANET) team to Trinidad and Tobago to conduct a medical assessment of 10 percent of the affected patients.[59] At that time, Trinidad and Tobago was not an IAEA member state. The cabinet applied for membership in July 2012, and the country was accepted later that year, effectively a member by November 9, 2012.[60]

A variety of factors influenced the country's decision to become a member state. The Ministry of Health describes membership as an "essential, inevitable and potentially beneficial component of healthy life."[61] The government has crafted a vision of "people-centered development" for the country; one of the main components of this vision is the recognition that "high quality health care is a basic right of each and every citizen of Trinidad and Tobago." Membership with the IAEA and the resulting benefits are expected to contribute to the transformation of the planned National Oncology Centre at the Eric Williams Medical Sciences Complex into a center of excellence for cancer care. While the incident at the BLCTC was not formally described as one of the reasons for joining the IAEA, membership allows Trinidad and Tobago greater access to IAEA expertise, programs and projects that could help improve the safety of the country's radiological and nuclear technologies and materials.

It is likely that Trinidad and Tobago's relationship with the IAEA will be founded firmly upon the intent to use IAEA programs and services for development goals. As a new member, Trinidad and Tobago has yet to participate in any TC projects with the IAEA. However, it has engaged in technical cooperation with one of the IAEA's main partners, WHO/PAHO.[62] Given the factors that Trinidad and Tobago considered when joining the IAEA, it is likely that the country is developing plans to participate in future TC projects, particularly with regard to improving food security and human health—both of which are development priorities for the country. Trinidad and Tobago has expressed little interest in nuclear power; it has large reserves of oil and gas, making it one of the wealthiest countries in the Caribbean.[63] (Oil, gas and petrochemical production account for 45 percent of the country's GDP, and its gas industry has been growing by 10 percent per year since 1988.[64])

Bringing Trinidad and Tobago into the Nonproliferation Conversation

Many countries without advanced nuclear programs—civilian or otherwise—interact with the IAEA primarily on the basis of TC activities. However, Trinidad and Tobago has the opportunity to engage with both the IAEA's nonproliferation mandate and its TC program, in tandem. While Trinidad and Tobago will likely develop TC projects based on human health and food security, it can also serve as a leader in its region for developing safety and security projects to protect new and existing radiological and nuclear technologies in the country. As with Kenya, prior successes surrounding the application of the dual-benefit approach to nonproliferation can serve as inspiration for a similar approach to engagement with the IAEA. The Caribbean Community (CARICOM), of which Trinidad and Tobago is a member, has already displayed a high level of connectivity concerning the dual-benefit approach. CARICOM countries have engaged enthusiastically with the UN 1540 Committee, and CARICOM has appointed a 1540 coordinator to oversee implementation of the resolution. Actors from the international community across the private and public sectors can work with actors in Trinidad and Tobago to translate the successes of the dual-benefit approach to UNSCR 1540 into IAEA TC projects that address the hard security, soft security, and development needs of the country.

While Trinidad and Tobago is not in the position of seeking to fill large gaps in development, it can serve as a partner for less developed countries in its region. Any future cooperation with the IAEA would help not only

Trinidad and Tobago but also neighboring countries. While the IAEA has already developed partnerships in the Caribbean region, the implementation of a dual-benefit approach to IAEA activities in Trinidad and Tobago could lead to a regional transformation of the way that the IAEA and the Caribbean interact on security and development issues. Trinidad and Tobago's example could also serve as a model for other countries across the world—particularly small island states and African states—that have not yet joined the IAEA as a result of misperceptions surrounding the agency's nonproliferation and development roles.

Challenges and Recommendations

As the leading international atomic organization with a portfolio spanning security and development programming, the IAEA has the most potential to foster effective nonproliferation dialogue with potential emerging zones of proliferation in the Global South. The dual-benefit approach to security and development challenges builds off the IAEA's diverse portfolio, and in some instances the IAEA's TC program is already beginning to improve awareness of nuclear safety and security across the developing world. Yet despite the IAEA's recent progress with engaging member states on these issues, the full potential of the IAEA to address evolving 21st-century proliferation trends has yet to be realized, primarily due to a variety of misperceptions of the IAEA's work and, in some cases, a lack of sustained funding.

Misperceptions of the IAEA

In its efforts to rebalance security and development priorities so as to increase member state participation across the entirety of the IAEA's mandate, the international community will have to address two fundamental misperceptions. The first—held by many developed and developing countries alike—is that the IAEA is primarily a "nuclear watchdog." Though the TC program is an essential component of the IAEA's mission, the IAEA is still seen primarily through the lens of its safeguard activities, whether by country governments, the media or the general public. The second misperception is the view that nonproliferation is a concern primarily for developed countries, and that nonproliferation efforts are less important in developed countries. To correct these misperceptions, the IAEA and the international community will have to address two fundamental challenges: 1) the limited funding available to the IAEA to execute its mandates, particularly its TC activities; and 2) the need for more effective streams of communication between the IAEA, its member states and the general public.

Funding

A challenge at the heart of the IAEA's activities is the increasingly limited nature of financial resources. Like all UN agencies, the IAEA is committed to zero real growth (ZRG) budgeting.[65] In some ways, ZRG budgeting has forced the IAEA to become efficient and effective. However, the so-called effectiveness and efficiency of ZRG often forces an agency or organization to simply "cut all its activities across the board without changing its priorities."[66] It is widely understood (and lamented) that the IAEA is underfunded. Nevertheless, in a global recession it would be challenging for the IAEA to expect to procure a considerable increase in financial resources.

Some of the IAEA's activities are funded outside of the regular budget and rely on contributions from member states; amounts vary from year to year. The bulk of the TC program is funded in this manner. As Figure 5 illustrates, the IAEA regular budget only funds the management costs of the TC program, and the program's regular operational budget is the lowest of the IAEA's six departments. However, the IAEA secured a 2.5 million euro increase in support for the TC program in its 2014 regular budget.[67]

The nonmanagement costs associated with TC activities are provided primarily by the Technical Cooperation Fund and supplemented by extrabudgetary resources and in-kind contributions. The bulk of these resources

and contributions come from member states, whether as donations or participation costs.[69] While the IAEA regular budget is constrained by ZRG, the Technical Cooperation Fund has in recent years been constrained by the economic realities of the global recession. Each year, the IAEA sets a targeted amount for TC activities. While the entirety of this amount is rarely met, member states are usually able to pledge amounts that exceed 85 percent of the IAEA's targets. From 2004-2008, pledges rose from approximately 90 percent to 96 percent of targets, and the IAEA was able to attain all of the funds pledged by member states. Since 2009, however, member states have pledged decreasing percentages of the IAEA's targets. Furthermore, in each year of 2010 through 2013, the IAEA has been unable to attain the entire amounts pledged by member states.

Figure 5. 2014-2015 IAEA Budget by Major Program (in millions of euros)[68]

Major Programme	2014	2015
1. Nuclear Power, Fuel Cycle and Nuclear Science	34.48	34.47
2. Nuclear Techniques for Development and Environmental Protection	38.48	38.49
3. Nuclear Safety and Security	37.11	37.11
4. Nuclear Verification	131.03	131.04
5. Policy, Management and Administration Services	76.94	76.95
6. Management of Technical Cooperation for Development	23.56	23.56
TOTAL	341.61	341.61

An additional constraint to funding is the unbalanced nature of member state engagement with the IAEA's mandate. Increases in funding to the IAEA may be contested within and among member states. As the IAEA's safeguards and verifications activities have grown more robust in response to emphasis from the Global North on nonproliferation, member states from the Global South have "adopted the tactic of linking increases in the verification budget to increases in the technical cooperation program."[70] Within the TC program, the differences in member state interests are illustrated by levels of funding. Lack of funding (not substance) is usually the culprit when TC projects are delayed for implementation at a later date. These projects may then be funded by donor states, but those states choose projects according to their own priorities. Given that developed countries—particularly the United States—are in the best position to fund these projects, and given that these countries often prioritize nonproliferation and nuclear security, many developing countries see this system as ignoring the priorities of the member states that make up the TC program's primary constituency.[71]

Despite various constraints and the recent setbacks in the attainment of resources for the TC program, 2013 was the best year in a decade for the Technical Cooperation Fund. As shown in Figure 6, the fund had approximately 66.3 million euros available, a significant improvement on the approximately 58.1 million euros available in 2012, and the greatest amount available for a single year in the past decade. With additional resources coming from extrabudgetary contributions and in-kind contributions, the total resources available to the TC program amounted to approximately 78.2 million euros in 2013. However, in previous years higher extrabudgetary resources and in-kind contributions resulted in greater overall resources available to the TC program, as illustrated in Figure 7. While the combined resources available in 2009, 2010 and 2011 outpaced those available in 2013, the positive change in the Technical Cooperation Fund from 2012 and 2013 could become a basis for further progress in coming years.

Figure 6. Available Resources in the Technical Cooperation Fund, 2004-2013[72] (in thousands of euros)

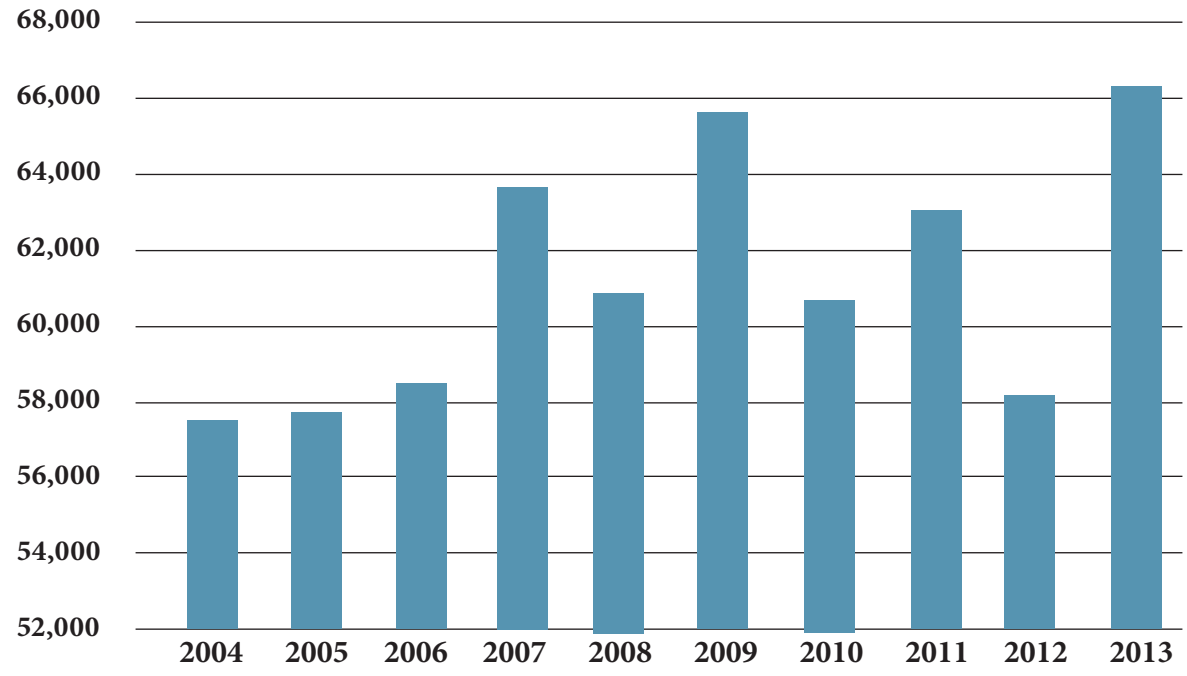
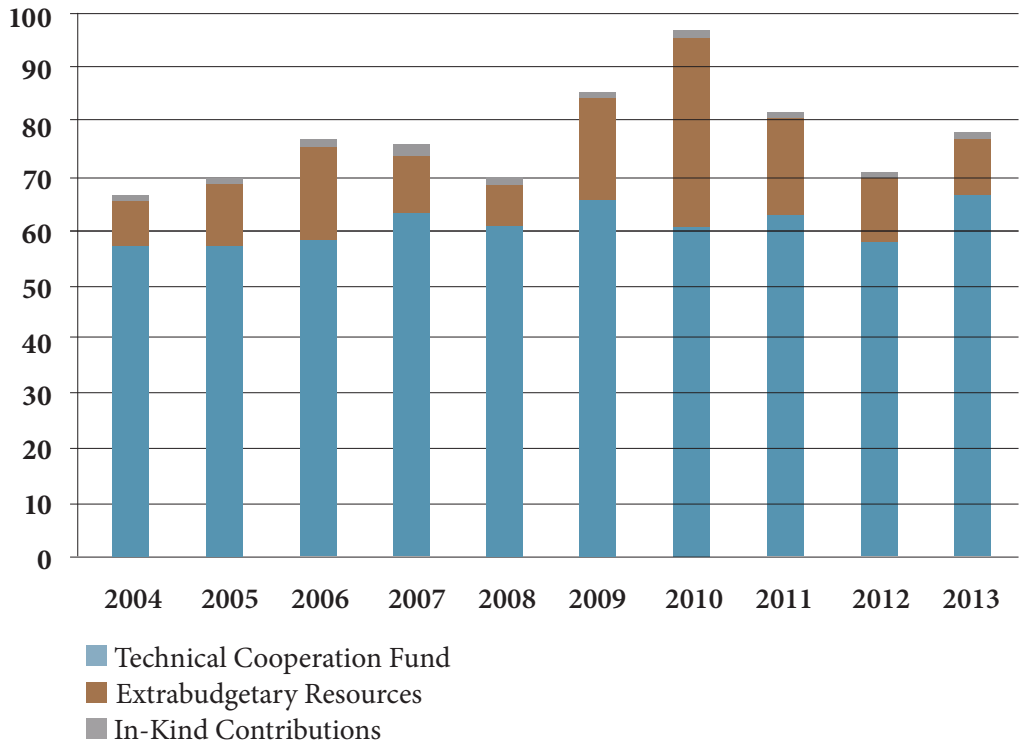


Figure 7. Total Resources Available to the IAEA Technical Cooperation Program, 2004-2013[73] (in millions of euros)



Recommendation 1: Build Innovative Public-Private Partnerships to Leverage Indigenous Expertise to Meet Financial and Capacity Shortfalls

The IAEA's greatest funding challenges will be gaining access to innovative resource streams as the recession and ZRG continue to deplete its current resources, while also managing the security and development debates among member states. Both these challenges can be addressed through the dual-benefit approach. One of the defining realities of the nexus between security and development is the fact that actors from across society—from governments to industry, from academia and NGOs to civil society—have a stake in both security and development issues. These stakeholders can offer new, innovative sources of funding and other resources to projects that address both security and development challenges.

In its 2013 Technical Cooperation report, the IAEA states that "improving interaction with the United Nations System and building partnerships" are two of its key strategies for "maximizing" the impact of the TC program. The IAEA recognizes that "every TC project" in the upcoming 2016-2017 cycle "will require partnership building, since few counterpart institutions can work alone to produce the desired project results."[74] Specifically, the IAEA singles out public-private partnerships as essential for the success of TC projects, particularly when projects require a significant financial commitment. The IAEA also recognizes that "the private sector can play an important role as an investor."[75]

- *For the IAEA*: In a 2010 report, an external auditor recommended that the TC program and the Secretariat would benefit greatly from pursuing partnerships spanning "a much broader range of stakeholders."[76] The most recent TC report demonstrates that the IAEA is prioritizing partnership-building in its TC program. The IAEA also can use its experiences cultivating partnerships across sectors to inform efforts at identifying new relationships. As the IAEA builds public-private partnerships, it should also explore the private sector's role beyond financial investments. In addition, it should work to ensure that new partnerships incorporate the priorities of member states receiving TC assistance alongside the priorities of project donors. Furthermore, the IAEA should explore new partnerships with civil society in order to draw upon a more comprehensive portfolio of expertise and contributions coming from outside the UN system.

- *For the International Community*: Actors across the international community—especially NGOs and private industry—should be proactive in developing strategies and projects that leverage their own resources and expertise to support agency activities. The private sector and civil society should not only engage with the IAEA and the UN system but also with member states of the IAEA, whether the member states in question are donors to the TC program, recipients of TC projects, or both.

Recommendation 2: Generate Funding for TC Projects through Nontraditional Resource Streams

One approach to limited resources is to find creative and efficient uses for existing sources, and the IAEA, which historically has struggled with limited funding, already has experience with efficient use of its available funds. An ideal strategy is to identify additional streams of funding, particularly for TC projects. The IAEA's best forum for generating productive discussions around proliferation and development priorities is through its TC program, as both developed and developing member states have an interest in seeing the program succeed (developing countries wish to see the program generate even greater development successes, while developed countries wish to see that TC projects are proliferation-resistant).

- *For the IAEA and Industry/Civil Society Partners*: One option to increase funding for TC projects is to submit a large-scale project—likely involving multiple countries or regions—for consideration to grant competitions at foundations in member states or in cooperation with private sector entities that view collaboration as a means to expanding market opportunities. However, such an application would require concerted effort on the part of the international community (including governments, NGOs and

industry) to prepare a comprehensive, well-organized TC project that can achieve sustainable development and security successes. Due to current funding and political constraints, TC projects are carried out on a small scale. In order for the impact to grow, the international community must partner with the IAEA to develop more robust projects and to secure the resources needed to ensure sustainable success. If the IAEA and the international community develop and implement a large-scale, multimillion-dollar project that generates sustainable development successes and proliferation resistance, member states as well as the general public may be able to recognize the IAEA's equally important roles as development actor and nuclear watchdog, thus helping to rebalance perceptions of the IAEA.

- *For Member States*: While IAEA officials provide guidance to member states when they are developing TC projects, the states themselves are responsible for building projects that adequately meet their development needs and their nonproliferation responsibilities, and must ensure that projects encompass these considerations. Member states must develop a streamlined approach to TC projects and must dedicate experienced personnel to their creation. In addition, the international community must help member states from the developing world meet the capacity requirements needed for developing these projects. For example, member states from the developed world could partner with member states from the developing world to help meet capacity needs and build projects that will generate sustainable success as well as meet global nonproliferation concerns.

Communication between the IAEA, Member States, and the Public

Beyond securing proper funding, the IAEA's ability to leverage its current mandate and portfolio of activities to meet 21st-century proliferation challenges will require strong channels of communication between the IAEA, member states and the general public. A defining characteristic of misperceptions surrounding the interconnected nature of security and development is the lack of recognition that the developing world has become a new arena for nuclear proliferation in the 21st century. Both developed and developing countries alike share this misperception. A developing country that does not recognize the important role it has to play in ensuring nonproliferation will not proactively engage in the global nonproliferation regime, especially as soft security concerns present more immediate threats. A developed country that does not recognize the proliferation potential of the developing world will miss out on opportunities to engage in development cooperation that incorporates nonproliferation priorities, thus making more efficient use of existing resources.

In its 2014-2015 budget report,[77] the IAEA acknowledges that "[e]nhancing the visibility, promotion and outreach efforts related to the Agency's technical cooperation programme…while targeting the development community, potential donors and partners" is a challenge that needs to be met. Improved communication is essential to creating a cohesive understanding of the IAEA as a nonproliferation and development stakeholder in equal measure. Though the IAEA maintains a professional staff, agency activities are determined in large part by how member states relate to the IAEA and to each other. Thus, the IAEA's ability to address 21st-century proliferation trends in the developing world relies on the improvement of communication between member states to encourage an understanding of the mutually supportive nature of the IAEA's security and development roles.

Recommendation 3: Build Public-Private Partnerships to Build Better TC Projects

Recently, the upper levels of the IAEA have pushed to generate more communication and cooperation among member states. Certainly, the TC program in and of itself necessitates effective communication and cooperation, as most of the expertise required by TC projects comes from IAEA actors working in the agency's other departments. Some problems do exist. For example, the Board of Governors (BoG) must approve TC projects before they can be implemented, yet it is common for the BoG to receive the list of upcoming TC projects for approval only one week in advance of board meetings, despite the fact that the list can include

nearly 1,000 projects.[78] The delegations often do not have enough time to review projects before they must be approved or rejected. Delays in approval of projects that involve a private partner can be damaging to the reputation of the IAEA as a reliable collaborator.

Projects must also be reviewed by the Department of Safeguards in order to identify and address any potential proliferation risks. In practice, these reviews encounter various obstacles. First, the projects submitted for review rarely include more than a title. A 2009 report from the US Government Accountability Office found that of the more than 1,500 projects noted by the US government as presenting a potential proliferation risk, 97 percent lacked any description beyond a title.[79] Even when project proposals include descriptions, they are unlikely to go beyond a few sentences, making proliferation potentials difficult to assess—and address—accurately. Second, not all safeguard reviewers clearly understand the subsequent steps to be taken once a project has been marked for proliferation potential.[80]

The lack of adequate descriptions accompanying project proposals and the short amount of time given to the BoG to review the proposals are two examples of the lack of communication among member states and agency actors that leads to misperceptions of how developed and developing countries engage with the IAEA, and of their respective nonproliferation and development concerns. Given that member states already see the IAEA's mandate according to unbalanced security and development priorities, this lack of communication breeds misunderstanding and makes it difficult for agency actors to effectively carry out the IAEA's full portfolio of activities.

- *For Member States*: As with the development of a large-scale TC project mentioned in Recommendation 2, member states and the international community must take a more proactive role in the development of comprehensive TC projects. It is in the interest of member states to ensure that they can develop a project that generates sustainable change and also does not elicit negative perceptions by other member states, especially those that may be persuaded to provide more funding to the TC program if the projects were proven to be both developmentally beneficial and proliferation-resistant. Thus, member states must take greater care when developing their projects. Additionally, member states from the developed world that wish to see proliferation-resistant projects must engage with other member states directly to leverage their resources and expertise to help develop projects that meet both nonproliferation and development needs.

- *For the International Community*: Actors across the international community—especially civil society groups, and even industry—can help their respective member state governments in this process by partnering to develop comprehensive projects. One of the key challenges for member states that engage in TC projects—especially some of the least-developed countries—will be securing the capacity and expertise needed to develop truly successful projects. Actors across the public and private sectors could help by contributing their own resources and specialized knowledge.

- *For All Actors*: Within the process of building up effective projects, all involved must account for the sensitive nature of information-sharing, which can be an obstacle but is not insurmountable. Participants in such a process must also remain respectful of the roles to be played by each actor: by member state representatives, by IAEA experts and by participants from the international community.

Recommendation 4: Improve IAEA Engagement with Member States and Potential Member States

Despite the significant role that member states play in determining how the IAEA can leverage its mandate and activities to meet nonproliferation and development needs, many member states from the developing world are not able to fully engage with the IAEA. Due to lack of resources and prioritization of other issues and forums, some member states do not have permanent representation at the IAEA in Vienna.[81] This hinders

the ability of many member states to actively engage in the IAEA's programming and governance. Another challenge is engagement with non-member countries. Though the IAEA has near universal membership, some countries—mostly in the developing world—have yet to join. For these countries, the perception of the IAEA as the "nuclear watchdog" reduces their likelihood of joining, as some governments do not understand the role that even small developing nations can play in preventing the proliferation of nuclear dual-use technologies. Additionally, countries may lack awareness of the IAEA's various development activities.

- *For the IAEA*: The IAEA should improve its engagement with member states, particularly those that lack the resources to maintain a permanent presence in Vienna. In many cases, this means engaging member states in places where they have a permanent presence, such as at UN headquarters in New York. Improvements in engagement are already underway, as these member states are increasingly invited to workshops and roundtables discussing the IAEA's myriad nonproliferation and development activities. Non-members should also be increasingly brought to the table in these discussions, to rebalance perceptions of the IAEA's mandate and to encourage more robust engagement with—and perhaps even membership in—the IAEA.

- *For the International Community*: Civil society organizations are also poised to help less-connected member states and non-members better understand the IAEA and its mandate. Many research centers, NGOs and universities are poised to put together events, workshops and conferences that can engage these countries directly and generate discussions of how the IAEA can address their development and security needs. Public and private actors (from government agencies to industry to academia to NGOs) can also organize events at or around IAEA conferences in order to encourage discussion among various actors from member states. These activities could provide much-needed forums for actors from the international community to have honest discussions about the mutually supportive nature of security and development initiatives.

Recommendation 5: Educate the Media and the Public on the IAEA's Nonproliferation and Development Roles

Unbalanced perceptions of the IAEA's nonproliferation and development roles are sustained in part by continued emphasis of the IAEA's role as a nuclear watchdog by the media, which influences public opinion. A rebalancing of perceptions cannot end at member states. The IAEA and the international community must engage the media and the public directly to provide a clearer picture of the organization's full spectrum of activities.

- For the IAEA: As the IAEA prepares itself to meet 21st-century trends in proliferation, it must also engage with media and the general public using 21st-century strategies and technology. The agency's Twitter and Facebook presence shows that it has integrated some aspects of social media into its outreach strategy. However, engagement in social media can always be more dynamic, and as technology changes and trends rise and fall, the IAEA's media team will need to adapt in order to engage the public with innovative and informative content. The IAEA must also train its experts and diplomats to be able to synthesize highly technical information into rhetoric that is easily digestible for the greater public.

- For Civil Society Organizations: NGOs, research centers and academic institutions can play an essential role in connecting the public and the media to the IAEA. During large-scale international events and crises, media professionals and the general public often turn to the expert community in civil society to offer their insights and recommendations. Using its media networks and other platforms for disseminating information, the expert community can engage directly with media and the public to help shape a discussion of the IAEA that is more balanced and better reflects the entirety of its nonproliferation and development roles. Contributions from expert communities can include providing interviews and quotes to media outlets, generating articles and op-eds, and hosting events open to the public that discuss the IAEA's nonproliferation and development roles.

Conclusion

As the IAEA faces new and evolving proliferation challenges in the 21st century, meeting those challenges in the coming decades will require leveraging its current mandate and portfolio of activities to bring the developing world more fully into the global nonproliferation regime. Since its creation in 1957, the IAEA has always possessed the mandate to carry out nuclear activities as they are related to both security and development needs. As such, the IAEA has been able to establish partnerships in both the developed and developing world. The central difficulty facing the IAEA—and much of the policy world—today is a problem regarding misperceptions of the interconnected nature of security and development in a globalized world. The results of these misperceptions are isolated policy approaches that address security threats and development challenges separately. Yet the interconnected nature of security and develop requires a dual-benefit approach that coordinates expertise and resources across the public and private sectors.

To the extent that IAEA member states can collaborate to improve understanding of the nexus between security and development and use that understanding to rebalance security and development initiatives, the IAEA will be able to successfully address the shifting proliferation dynamics of the 21st century. The tools—including the IAEA's mandate and its six departments—are already available, and the dual-benefit approach to security and development provides the framework for their use.

With help from the international community, the dual-benefit approach can be carried out in pilot projects in select IAEA member states that are not traditionally part of the nonproliferation conversation. As a new member state, Trinidad and Tobago could demonstrate how developing countries can build strong TC project portfolios to meet security and development needs through robust relationships with the IAEA and other partners. As a long-time IAEA member state with a solid relationship based on TC projects, Kenya could serve as an example of how the IAEA can help a developing country transition more fully into safety, security and safeguard activities, using its TC projects as an entry point into a broader conversation about security and development. Successful applications of the dual-benefit approach in each of these countries could then serve as a springboard for greater implementation of the approach across the Caribbean and Eastern Africa. Rebalancing security and development priorities among member states is not the sole responsibility of the IAEA. Other actors—such as governments, and members of industry and civil society—must not only engage with the IAEA through the dual-benefit approach but also serve as proactive actors in their own right. International actors can encourage discussion among their constituents and audiences about the mutually supportive nature of security and development. This discussion itself is not new and has been occurring over the last decade. Governments from across the developed world are increasingly incorporating the dual-benefit approach into their own development and security cooperation programs. Actors from the private sector—such as technology and supply-chain companies—are also forming partnerships with developing countries that capitalize on industry expertise to help meet both security and development goals.

In the 21st century, globalization has linked the security and development concerns of all countries together in a way that is unlikely to be easily broken. If security and development challenges are locked in conversation with each other, so too must a dialogue be opened that incorporates the policies and initiatives aimed at meeting those challenges. The world will not become safer and more prosperous if actors from both the Global North and the Global South continually talk at or over each other on matters of security and development. Only by talking with each other can all stakeholders—developed and developing countries alike, as well as state and nonstate actors alike—realize their priorities and goals in the 21st century.

Appendix A. List of IAEA Member States (as of August 18, 2014)[82]

Afghanistan
Albania
Algeria
Angola
Argentina
Armenia
Australia
Austria
Azerbaijan
Bahamas
Bahrain
Bangladesh
Belarus
Belgium
Belize
Benin
Bolivia
Bosnia and Herzegovina
Botswana
Brazil
Brunei Darussalam
Bulgaria
Burkina Faso
Burundi
Cambodia
Cameroon
Canada
Central African Republic
Chad
Chile
China
Colombia
Congo
Costa Rica
Cote d'Ivoire
Croatia
Cuba
Cyprus
Czech Republic
Democratic Republic of the Congo
Denmark
Dominica
Dominican Republic
Ecuador
Egypt
El Salvador
Eritrea
Estonia
Ethiopia
Fiji
Finland
France
Gabon
Georgia
Germany
Ghana
Greece
Guatemala
Haiti
Holy See
Honduras
Hungary
Iceland
India
Indonesia
Iran, Islamic Republic of
Iraq
Ireland
Israel
Italy
Jamaica
Japan
Jordan
Kazakhstan
Kenya
Korea, Republic of
Kuwait
Kyrgyzstan
Lao People's Democratic Republic
Latvia
Lebanon
Lesotho
Liberia
Libya
Liechtenstein
Lithuania
Luxembourg
Madagascar
Malawi
Mali
Malta
Marshall Islands
Mauritania
Mauritius
Mexico
Monaco
Mongolia
Montenegro
Morocco
Mozambique
Myanmar
Namibia
Nepal
Netherlands
New Zealand
Nicaragua
Niger
Nigeria
Norway
Oman
Pakistan
Palau
Panama
Papua New Guinea
Paraguay
Peru
Philippines
Poland
Portugal
Qatar
Republic of Moldova
Romania
Russian Federation
Rwanda
San Marino
Saudi Arabia
Senegal
Serbia
Seychelles
Sierra Leone
Singapore
Slovakia
Slovenia
South Africa
Spain
Sri Lanka
Sudan
Swaziland
Sweden
Switzerland
Syrian Arab Republic
Tajikistan
Thailand
The Former Yugoslav Republic of Macedonia
Togo
Trinidad and Tobago
Tunisia
Turkey
Uganda
Ukraine
United Arab Emirates
United Kingdom of Great Britain and Northern Ireland
United Republic of Tanzania
United States of America
Uruguay
Uzbekistan
Venezuela
Vietnam
Yemen
Zambia
Zimbabwe

Appendix B. Technical Cooperation Projects in 2013 Across Region and Theme

According to the IAEA's 2013 Technical Cooperation report, a significant shift has occurred in the program in favor of projects aiming to improve the safety and security of nuclear and radiological materials. Across the four regions where TC projects are implemented, health and nutrition accounted for 28.6 percent of the total actuals of the TC program. Safety and security accounted for 22.8 percent, and food and agriculture accounted for the third-highest proportion of actuals at 16.3 percent. In 2013, 124 countries or territories received TC support.[83]

The following figures illustrate regional engagement in TC projects in 2013. Each figure illustrates the distribution of regional projects across each of the TC program's six themes. Of particular note is the distribution of TC projects in Asia and the Pacific, shown in Figure 10. Safety and security projects account for the highest proportion of those carried out in the region in 2013, followed by health and nutrition. As Figures 8 and 9 show, safety and security projects accounted for the second-highest proportion of projects in Europe and in Latin America and the Caribbean. In Africa, safety and security accounted for the third-highest proportion of projects, behind health and nutrition, and food and agriculture, as shown in Figure 11.
The relatively high percentage of safety and security projects undertaken by IAEA member states could provide a foundation upon which to build greater safety, security and nonproliferation engagement between the IAEA and member states across the developing world.

Figure 8. TC Actuals in the Europe Region by Technical Field (2013)

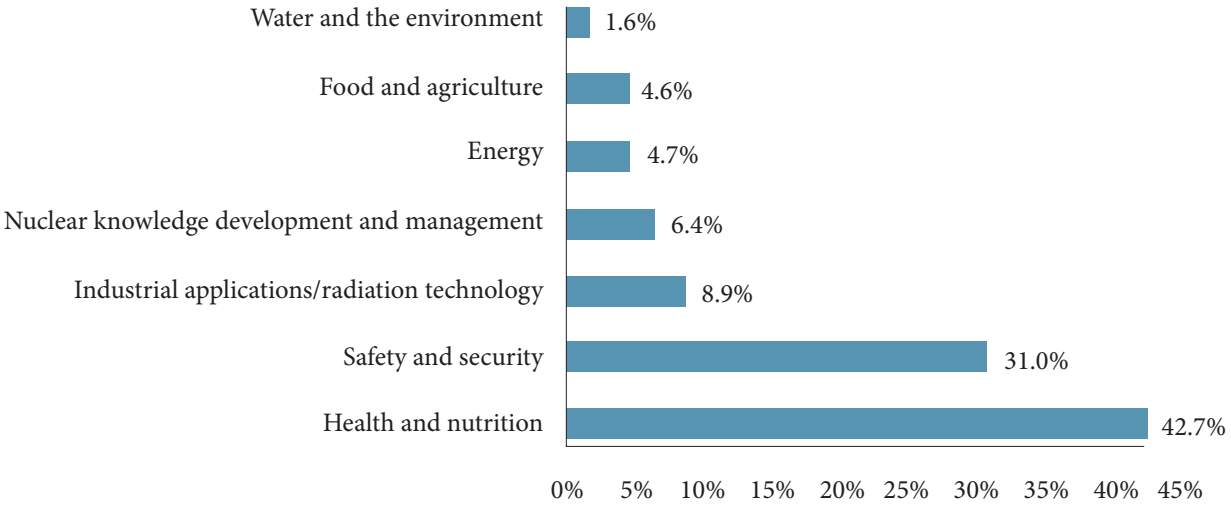


Figure 9. TC Actuals in the Latin America Region by Technical Field (2013)

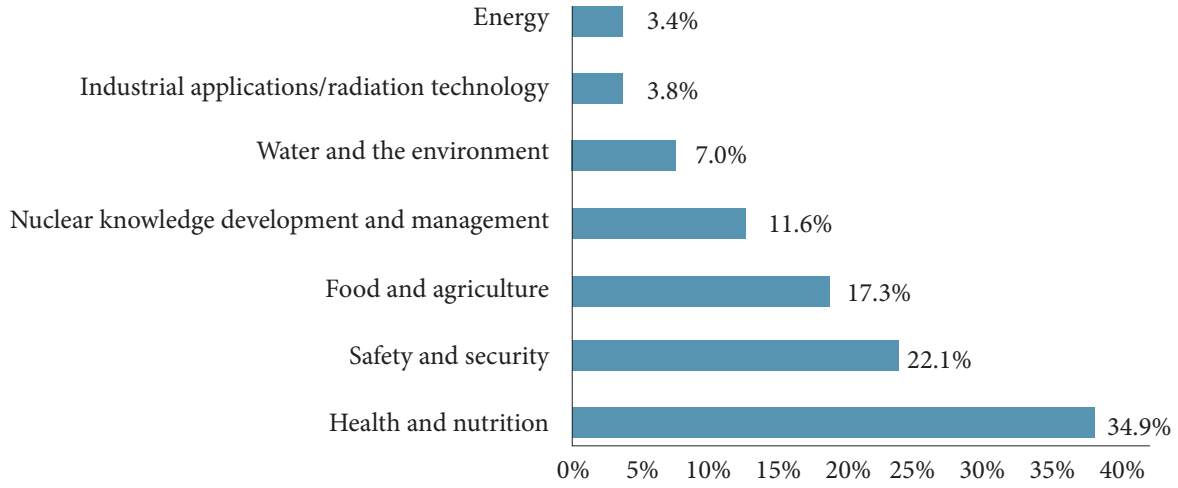


Figure 10. TC Actuals in the Asia and the Pacific Region by Technical Field (2013)

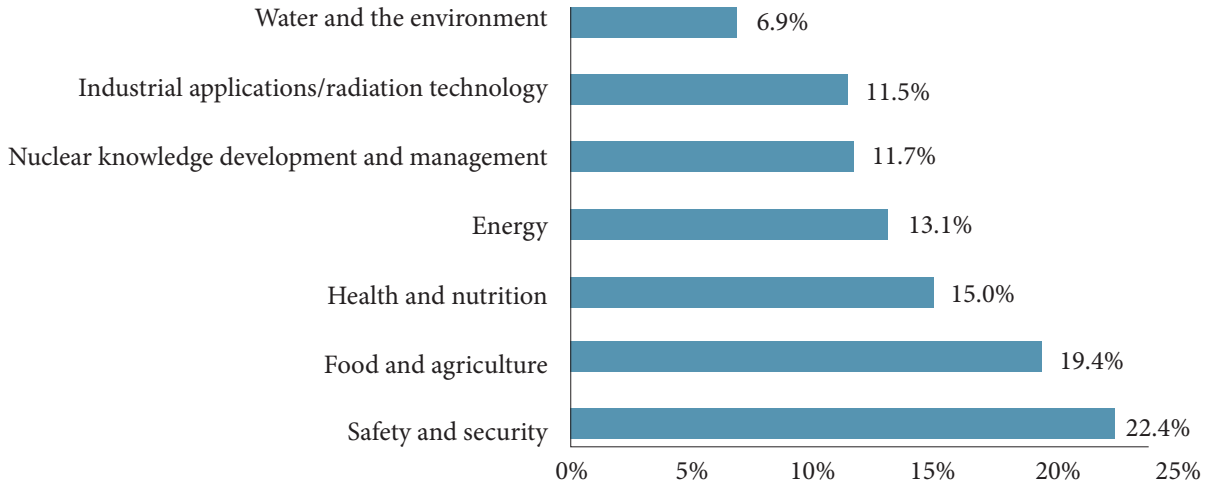
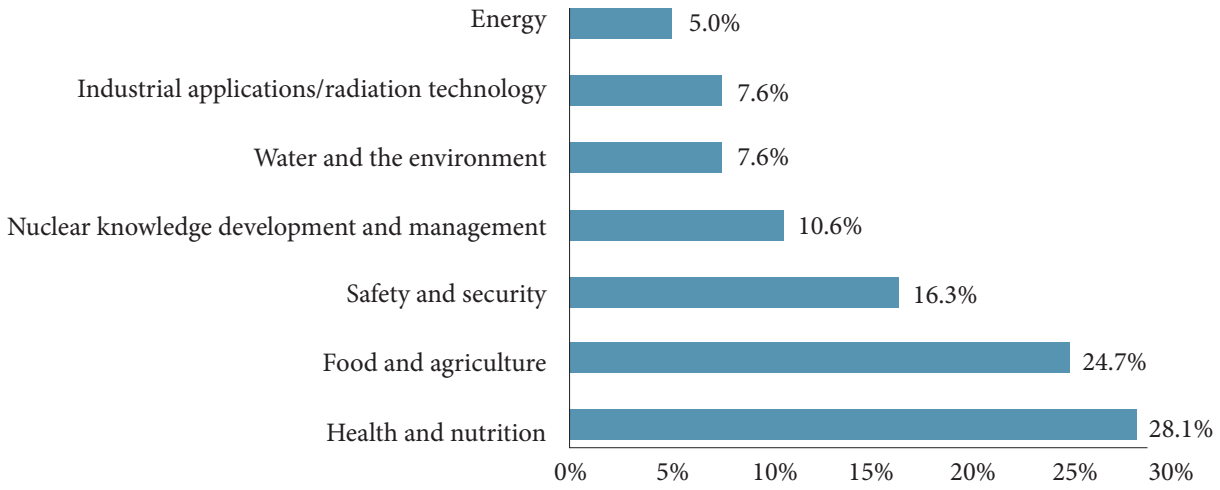


Figure 11. TC Actuals in the Africa Region by Technical Field (2013)



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11. Findlay, *Unleashing the Nuclear Watchdog.*

12. Discussions at international forums have begun to explore the relationship between security and development; one such discussion took place at the UN Security Council in February 2011, when IAEA member states stressed the "need to take into account the economic and social dimensions of conflict, in addition to the political factors of maintaining international peace and security," according to the UNSC Presidential Statement. (http://www.un.org/News/Press/docs/2011/sc10172.doc.htm.)

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26. Based on current trends, water availability is likely to decrease in many regions – even as water consumption from agriculture alone is expected to increase by approximately 19 percent by 2050. (UN Water, "Facts and Figures.")

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About the Managing Across Boundaries Initiative

Transnational challenges—from the proliferation of weapons of mass destruction and illicit trafficking to terrorism, the spread of disease, counterfeit intellectual property and environmental crime—threaten geostrategic stability, people, and socioeconomic development worldwide. The Managing Across Boundaries Initiative develops innovative government responses at the national, regional and international levels, and identifies pragmatic public-private partnerships to mitigate these threats.

Unlike traditional assistance measures, the "dual-benefit" approach to security and development helps bridge the gap between "soft" security (development, human security) and "hard" security (nonproliferation) objectives, thereby addressing identified in-country needs of the Global South while building state capacity to manage and ensure the sustainability of nonproliferation and global security efforts. The result is less duplication of effort, and more efficient utilization of limited resources for the global good. Further information can be found at http://www.stimson.org/programs/managing-across-boundaries/.

About the Author

Audrey Williams was most recently the Fall 2013 Herbert Scoville Jr. Peace Fellow at the Stimson Center. She provided research support to the Managing Across Boundaries Initiative, where she worked closely with senior staff on projects covering the nexus between security and development in the 21st century. Prior to her work at the Stimson Center, Williams was a policy programming intern at the Stanley Foundation in Muscatine, Iowa, where she provided support to the foundation's nuclear security programming. Williams holds degrees in political science and French from the University of Iowa, where she graduated with honors. At the University of Iowa she was an Honors Writing Fellow, a Presidential Scholar, and a member of the Iowa Policy Research Organization. Williams has studied in Istanbul, Turkey, and Fez, Morocco. She speaks French and Turkish.

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