



**NATIONAL ACADEMIES – U.S. INSTITUTE OF PEACE  
ROUNDTABLE ON TECHNOLOGY, SCIENCE, AND PEACEBUILDING**

**Second Meeting  
December 12, 2011  
USIP Headquarters Building  
Washington, D.C.**

**SUMMARY REPORT**

**OVERVIEW**

The second meeting of the National Academies – U.S. Institute of Peace (NA-USIP) Roundtable on Technology, Science, and Peacebuilding took place December 12, 2011 at the U.S. Institute of Peace headquarters building in Washington, D.C. It began at 8 a.m. and concluded at 4:30 p.m. A total of 23 Roundtable representatives attended: 7 from the NGO community, 10 from U.S. government agencies, 5 from the corporate sector, and 1 from academia.

The agenda comprised four 75-minute sessions, each addressing a proposed Roundtable activity area: 1) Adapting Agricultural Extension to Peacebuilding, 2) Sensing Emerging Conflict, 3) Harnessing Systems Methods for Efficient Delivery of Peacebuilding Services, and 4) Data Sharing to Improve Coordination, Planning and Decision Making.

Each session was introduced by a staff member of the Roundtable secretariat, who provided a brief overview of the problem the proposed activity is intended to address. An expert commentary and moderated discussion followed to determine 1) whether the problem and potential project were adequately characterized and, if so, 2) what follow-on activities (Roundtable workshop, commissioned paper, or other activity) would be appropriate.

**WELCOME, GOALS FOR THE DAY, INTRODUCTIONS**

Roundtable Co-Chairs Richard Solomon (USIP), and Charles M. Vest, National Academy of Engineering (NAE), started the meeting by welcoming participants. Amb. Solomon pointed to recent events in Sudan (conflict over agricultural resources), Haiti (collaboration by NGOs), and Egypt (organizing for social change) to show the relevance of the Roundtable's work linking science and technology to conflict management and stabilization. Dr. Vest echoed Amb. Solomon's welcome and explained that the Roundtable secretariat developed the agenda topics based on feedback from the first meeting in May and subsequent discussions with Roundtable members.

Both co-chairs emphasized that the goal of the meeting was to validate the importance of these four potential activity areas to Roundtable members and engage the membership in discussion about next steps. At the end of the day, they noted, members would be asked to commit personnel and other resources to particular follow-on work.

**INTRODUCTORY REMARKS: UNDER SECRETARY OF STATE MARIA OTERO**

The meeting began with remarks from the Honorable Maria Otero, Under Secretary of State for Democracy and Global Affairs. She described ambitious goals the U.S. State Department has for using technology to detect, manage, and respond to conflict. In particular, she described how State intends to make conflict prevention and response a core element of Secretary

Clinton's vision for enhancing civilian security globally. The State Department is looking to technology to help address the root causes of conflict, to create sustainable civil institutions, and to build capacity for broad citizen engagement, she said. Under Secretary Otero noted she was assuming a new role at the State Department as Under Secretary for Civilian Security, Democracy, and Human Rights. In this position, she will work to build capacity to create sound and accountable democracies, to predict and prevent conflict, and to create humanitarian diplomacy that can meet global needs. She reiterated that science and technology will play a major role in helping the State Department achieve these goals, for example by helping control voting fraud, anticipating emerging conflicts, and improving knowledge integration across the entirety of U.S. peacebuilding activities.

## **SESSION I: ADAPTING AGRICULTURAL EXTENSIONS SYSTEMS TO PEACEBUILDING**

Dr. Sheldon Himelfarb (USIP, Roundtable Secretariat) introduced the first session by describing disputes over land and water as a major driver of conflict in agricultural communities. Ownership of these agricultural resources is defined as often by practice as by law, and when disagreement arises, it has the potential to escalate into armed conflict. War can further compound such problems by destabilizing communities through the influx of internally displaced persons who may not respect traditional approaches to land and water use.

At the Roundtable's first meeting in May 2011, Deputy Under Secretary Ann Bartuska (USDA) suggested that agricultural extension systems might help manage conflict in rural communities. Traditionally, extension has worked as a form of technology transfer, providing farmers with new tools and information to improve agricultural productivity. Over the past 20 years, however, extension systems have becoming more involved in organizing the economic activities of rural communities by providing access to markets, financing, and even establishing producer organizations. Dr. Himelfarb described a proposed activity in which extension personnel might be trained to help resolve disputes over land and other assets and, by so doing, strengthen rural institutions and civil society. Such an effort would require innovations in training for extension personnel and for extension organizations, as well as improvements in communications technology used by extension services.

In thinking about potential implementation partners and sources of funding, Dr. Himelfarb noted the Roundtable Secretariat has been in discussions with USDA, USAID, and the non-member FAO. One idea discussed is a pilot project to test the concept in South Sudan or Afghanistan. Other Roundtable members, including CRDF and InterAction, have also expressed interest.

In response, Mike McGirr, a National Program Leader at USDA's Center for International Programs and an expert in agricultural extension, offered a broad overview of agricultural extension, of the problems it faces in conflict zones, and of the potential offered by a peacebuilding-oriented agricultural extension system. Mr. McGirr said that peacebuilding extension showed potential as a means for managing conflict, but he noted the concept would likely face challenges. He predicted, for example, that it will be difficult to convince extension managers that peacebuilding is an integral part of development and that the acquisition of peacebuilding skills will improve their capacity to help farming communities. In addition, Mr. McGirr said, any peacebuilding extension approach will need to be flexible and tunable to the particulars of a given conflict, and where such an effort is housed (e.g., in a government ministry, civil society organization, producer organization, for-profit company) needs to be carefully considered. Finally, he said, because the financing and policy support for extension in conflict zones tends to be unstable, thought must be given to sustaining such a peacebuilding extension initiative.

Dr. Bartuska began the discussion by emphasizing her enthusiasm for the proposed project. She indicated the concept of peacebuilding extension fits within a larger initiative under way at USDA to create a global agricultural system capable of feeding 9 billion people. Under Secretary Catherine Woteki (USDA) concurred, emphasizing the systems nature of the problem and the importance of engaging the private sector in this type of project. Subsequent discussion emphasized the importance of local ownership to the success of an effort like this. Mr. John Marks (Search for Common Ground) framed the discussion in terms of “appropriate technology,” and Mr. Gregor Bailar (Capital One Financial Corp. [ret.]) emphasized developing the right mechanism to train extension agents. Ms. Pamela Aall (USIP) pointed to the need to provide extension officers with the skills necessary to navigate the in-country political environment.

In terms of next steps, Mr. Elmer Roman (Defense) and Mr. McGirr both suggested the possibility of learning from U.S. Army experiences working in rural communities as part of a counter-insurgency strategy. Dr. Woteki (USDA) suggested that a useful start to understanding what peacebuilding extension is would be a series of case studies of existing extension programs in conflict zones. Dr. Linton Wells (National Defense University) noted that “negative” case studies that investigate failed interventions may be especially instructive. Dr. Vest (NAE) summarized the session by hypothesizing that a peacebuilding extension system would be characterized by additional training to provide extension experts with the capability to manage highly politicized encounters and to respond flexibly as circumstances changed.

## **SESSION II: SENSING EMERGING CONFLICT**

Dr. Himelfarb (USIP, Roundtable Secretariat) introduced the session by noting the potential value to peacebuilders of being able to anticipate the outbreak of violent conflict. If done reliably, such advance intelligence might allow earlier intervention, thereby reducing the human and financial toll of conflict or perhaps even avoiding certain conflicts altogether. Much attention has focused recently on techniques and tools for capturing and making sense of massive amounts of publicly available data generated by social media—things like Twitter, SMS, and Facebook. Google’s Flu Trends ([www.google.org/flutrends](http://www.google.org/flutrends)) is an example of the potential predictive power of this kind of data mining, he said. In that project, a rise in flu-related searches on the Google search engine has been correlated with actual increases in flu incidence in specific parts of the world, and the Google analysis has been shown to be as much as two weeks faster in identifying outbreaks than the Centers for Disease Control and Prevention’s own disease surveillance. Dr. Himelfarb noted that there are at least two other types of sensing technology that have potential as peacebuilding tools: on-the-ground sensors and sensor networks, and geographic information systems.

Dr. Himelfarb next briefly outlined a proposed sensing project developed by USIP staff that would combine aspects of social media data analysis with participatory mapping, which can engage local populations directly in the collection of place-based data, such as reports of election fraud, incidents of ethnically motivated violence, and land boundary disputes. Such mapping projects often have limited impact in supporting crisis response efforts, in part because of insufficient coordination between the technical specialists who have organized and led mapping initiatives and the end users of the data who are charged with responding to these crises. The USIP proposal seeks to bridge the gap between the producers and the end users of data on conflict risks and peacebuilding resources by 1) determining what information and analysis international actors, such as governments, multilateral organizations, humanitarian NGOs, and international corporations need and 2) helping assure community security by empowering residents of conflict-prone regions to take actions that build peace in their own communities.

Mr. Jason Matheny, a program manager with the Open Source Indicators (OSI) program of the Intelligence Advanced Research Projects Activity (I-ARPA), described a new OSI research initiative that seeks to leverage publicly available data sources to predict human behavior. Many of the technological tools and statistical methods grantees under this program are likely to employ will be similar to those needed by the peacebuilding community, and many of the challenges the I-ARPA program will face mirror those for peacebuilding, such as assuring the validity of the predictions generated by crunching data from huge numbers of social interactions. The OSI initiative,<sup>1</sup> Mr. Matheny said, seeks to develop methods for continuous, automated analysis of public data in order to anticipate and/or detect societal disruptions, such as political crises, disease outbreaks, economic instability, resource shortages, and responses to natural disasters. A unique aspect of the program is its goal of fusing data from multiple sources, such as web search queries, blogs, microblogs, internet traffic, webcams, financial markets, and Wikipedia edits. Among a host of challenges grantees will face is the development of multivariate time series models robust to non-stationary, “noisy” data that can reveal patterns that precede events, Mr. Matheny said.

Amb. Solomon began the discussion by reminding the group that even if sensing technologies can successfully detect a brewing conflict, there is still the challenge of deciding what action should be taken. Dr. Fred Tipson (USIP) noted that sensing technologies can be used both for “good” purposes consistent with the Roundtable’s mission and for “bad,” such as some countries’ efforts to monitor and control public use of the Internet. Mr. Gregor Bailar (Capital One Financial Corp. [ret.]) predicted that considerable research on analytics will be needed to make use of multiple sources of time-series data, and he noted much of the existing research in this domain is being driven by the advertising industry. Prof. Linton Wells (National Defense University) stated that for any data-mining effort to be useful it must result in a “transaction” of benefit to the local population, and there must be feedback from that population so one knows how effective the intervention has been. Mr. Jack Duvall (International Center on Nonviolent Conflict) and Dr. Nigel Snoad (Google) both noted that in situations where modern communication technologies are scarce, the content of traditional media such as newspapers and radio can be analyzed for information useful to sensing nascent conflicts. Mr. Ben Riley (DOD) described recent DOD work successfully correlating wide area surveillance data generated by radar with structured survey results from Gallup. Such correlations, he suggested, indicate the strong potential for the kinds of hybrid data analyses suggested by Dr. Himelfarb at the outset of this session. Dr. Mark Epstein (Qualcomm) suggested that such sensing technologies may also be important as means not only to sense emerging conflicts but also to monitor how different policy interventions may be reducing tension and the likelihood of conflict.

### **SESSION III: HARNESSING SYSTEMS METHODS FOR EFFICIENT DELIVERY OF PEACEBUILDING SERVICES**

It is well accepted that peacebuilding is a complex phenomenon in which multiple stakeholders with different missions, capabilities, levels of funding, and modes of operation work in often unfamiliar and pressured environments. Consequently, interventions tend to use resources inefficiently and, often, ineffectively. Haiti’s “republic of NGOs” is the poster child for what can happen. There, an absence of political will and institutional capacity forced responsibility for reconstruction on thousands of NGOs. Although substantial investments have been made by peacebuilding organizations in IT infrastructure and process planning, poor coordination and communication among and between funders and service providers continues to hamper recovery and rebuilding efforts.

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<sup>1</sup> The full Broad Agency Announcement can be viewed here:  
<https://www.fbo.gov/utills/view?id=022c497cd8f84511eccf669a0059dd5e>

Dr. Proctor Reid (NAE, Roundtable Secretariat) described the Secretariat's view that a potential solution to managing this complexity lies in exploiting the methods and perspectives of operational systems engineering (OSE). OSE combines science and mathematics to improve the operations of systems that deliver goods and services. To analyze and describe such complex systems, operational systems engineers use deterministic and probabilistic mathematics to describe how systems perform, design systems based on those descriptions, and integrate all elements of these systems to improve efficiency and effectiveness. Over the past 10 years, the National Academies have been applying OSE approaches to the problem of managing the delivery of health services. Dr. Reid described a strong parallel between the decentralized, poorly coordinated way in which health services are delivered and how peacebuilding services are delivered. He outlined a possible Roundtable project patterned loosely on a recently completed project on the role of systems engineering in improving traumatic brain injury (TBI) care in the Military Health System.<sup>2</sup> A first step, Dr. Reid suggested, might be to bring together peacebuilders and systems engineers to identify specific elements of peacebuilding activities that might most usefully be examined through a systems engineering lens.

In response, Dr. Peter Cherry (SAIC, ret.) asserted that applying a systems engineering approach to peacebuilding could have a high payoff both for stability of the societies served by the peacebuilders and for effectiveness of peacebuilder organizations. By treating peacebuilders as service providers, an OSE approach views coordination as a problem of supply and demand. Given NAE's experience modeling demand for TBI care and the peacebuilding expertise of many Roundtable members, characterizing demand for peacebuilding services should be straightforward, Dr. Cherry said. Similarly, defining who the service providers are and what delivery costs are for peacebuilders in crisis zones can be based on existing data and Roundtable member knowledge. Dr. Cherry thought that identifying short- and long-term impacts of this kind of approach, together with the dependencies and interactions that affect these outcomes, would be more challenging but feasible given participation of members of the peace building community. He also noted that this application could be tailored and incremental.

Ms. Melanie Greenberg (Alliance for Peacebuilding) began the discussion by reemphasizing the highly competitive and poorly coordinated nature of many peacebuilding interventions. Currently, she said, there is no model or mechanism for addressing this problem. Dr. Thom Feroah [Alliance for Peacebuilding] elaborated on the potential for medical models to manage conflict by describing how a systems approach using the human genome will soon enable individualized medicine in which treatment is customized precisely to each patient. Mr. Elmer Roman (DOD) agreed that a systems approach is the best way to manage a peacebuilding process but observed that any approach would need to pay careful attention to system dynamics because of the uncertain feedback loops and potential for rapid change in a conflict environment. Mr. Gregor Bailar (Capital One Financial Corp. ret.) suggested the Roundtable also consider approaches other than OSE to deal with the coordination challenges of peacebuilding interventions. He mentioned agile software development and lean manufacturing as two methods used in industry to manage incompletely defined, complex problems flexibly. Dr. William Colglazier (State) suggested two topics with widespread applicability in post-conflict environments that could benefit from the application of OSE: 1) the management of post-conflict elections, and 2) the operation of mobile courts to advance post-conflict justice and reconciliation. John Marks (Search for Common Ground) said that in his experience, the pressure to save lives in crisis forces rapid engagement. Success goes to those who can respond flexibly to what is learned during engagement. Amb. Solomon said

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<sup>2</sup> David Butler, et. al., eds. 2009. Systems Engineering to Improve Traumatic Brain Injury Care in the Military Health System: Workshop Summary. Washington, DC: The National Academies Press.

that, given the State Department's decision to establish the Office of Conflict Stabilization Operations, the Roundtable's discussion of a more systematic approach to peacebuilding is timely.

#### **SESSION IV: DATA SHARING TO IMPROVE COORDINATION, PLANNING AND DECISION MAKING: THE UNITY PLATFORM**

Amb. Solomon introduced this session by noting that one critical element of a systems approach to peacebuilding, the subject of the previous session, is the ability to manage large amounts of diverse data generated from multiple sources. At the Roundtable's first meeting in May, the desire for improved communication and coordination among peacebuilding organizations was cited as a priority by more members than any other single topic. Dr. Reid (NAE, Roundtable Secretariat) introduced the UNITY platform, a partnership between DOD and USAID to support sharing of non-classified information and enable greater collaboration during the planning, monitoring, and evaluation of projects intended to build peace. He noted that one potential role for the Roundtable might be to help the UNITY partner agencies, DOD and USAID, think about how the software platform, or something like it, can best meet the needs of the peacebuilding community.

Mr. Mark Hainsey (USACE) provided a brief overview of UNITY's goals and capabilities. The platform is meant to meet a cooperative security goal for federal agencies with a role in peacekeeping, humanitarian assistance, reconstruction, and stability operations, he said. Specifically, it is intended to provide integrated adaptive planning, decision support and assessment capabilities for a "whole-of-government" effort. UNITY connects communities of interest, including potentially non-government organizations, such as the World Bank, via the All Partners Access Network ([www.apan.org](http://www.apan.org)). By "ingesting" project data from a variety of government and non-governmental organizations, the system can show who is doing what where. UNITY has the potential to analyze U.S. foreign policy strategies across more than 85 countries, Mr. Hainsey said.

Mr. Elmer Roman (DOD) opened the discussion by suggesting that the next phase of development of UNITY should focus on expanding the user base beyond the initial two federal agencies, including to non-federal partners. Roundtable member Dr. Ann Bartuska (USDA) asked whether agriculture-related data could be included in UNITY, which would make the system more useful to her agency, and Roundtable member Mr. John Marks (Search for Common Ground) urged the UNITY team to consider engaging the Department of State. Mr. Roman indicated UNITY staff would look into both of these suggestions. Dr. Bartuska also asked the UNITY team to consider making a presentation on the platform to members of the online Forum on Global Food Security and Nutrition, an initiative of the Food and Agricultural Organization. A number of Roundtable members suggested that, with enhancements, UNITY could perform a very useful, trust-building function for the peacebuilding community as well as help document the impact of peacebuilding investments. There was also discussion about security issues and other concerns a system like UNITY may present. Amb. Solomon suggested UNITY might benefit by a "red team" analysis to identify potential vulnerabilities. Mr. Gregor Bailar (Capital One Financial Corp. [ret.]) noted that some of the most potentially valuable, or "juicy" data, might not be made visible by UNITY because of organizational "stove-piping." As UNITY becomes more sophisticated and its data more useful, he added, access to some parts of the platform may need to be restricted for security reasons.

#### **AROUND THE ROOM**

Amb. Solomon brought the day to a close by circling back to the concerns Under Secretary Otero raised at the start. In societies in conflict, how should the U.S. government work to build civil authority, to strengthen weak government institutions, and to improve civilian security? He emphasized that these are enduring questions whose answers will require developing shared goals that can organize the enormous resources of the U.S. government. Roundtable members were then asked to suggest the most important takeaway from the day's discussion. Among the points made were the following:

- The Roundtable can be a basis for better organizing peacebuilding as a field and as a means to bring different constituencies together on issues of common concern;
- As technological solutions are developed, the fundamental political nature of the peacebuilding process needs to be kept in mind;
- Roundtable projects need to be tightly defined, so that the Roundtable agenda is realizable;
- One metric of success for the Roundtable might be how well its activities reduce information stove-pipes within and between stakeholder organizations; and
- It will be very important to the success of the Roundtable that member organizations help develop the proposed projects into full-blown action plans.

Before adjourning, Roundtable members filled out a short survey in which they ranked the four proposed activity areas and offered expertise from their own organizations to help plan follow-on work, such as targeted workshops, on the topics of most interested to them. Drs. Vest and Solomon strongly encouraged each member to consider how to make this commitment.