Transnational public sector knowledge networks: Knowledge and information sharing in a multi-dimensional context

Sharon S. Dawes *, Mohammed A. Gharawi, G. Brian Burke

Center for Technology in Government, University at Albany, 187 Wolf Rd., Albany, NY 12205, USA

ARTICLE INFO

ABSTRACT

Sharing of knowledge, information, and practices across cultural and national boundaries has become a means to address critical global problems. As government agencies increasingly collaborate with international counterparts on these issues, transnational knowledge and information sharing networks grow in importance as mechanisms for collaboration. This paper explores the nature of transnational public sector knowledge networks (TPSKNs) and identifies critical contextual factors that shape their performance. In these networks, each participating organization operates within complex national, organizational, and information contexts. The contextual differences between participants produce distances in culture, politics, intentions, organizational factors, relationships, knowledge, resources, geography, and technology. These distances influence their ability to engage in the processes and interactions that are essential to network performance. The paper concludes with a conceptual dynamic model that accounts for the relationships among these factors that can guide further research in understanding knowledge and information sharing across national and cultural boundaries.

© 2011 Elsevier Inc. All rights reserved.

1. Introduction

Governments of the world are engaged in a complex global network of political, societal, and economic dependencies, enabled in part by the expanding capabilities of information and communication technologies. These international engagements demand new kinds of knowledge sharing networks and information systems that combine both social and technical dimensions. Slaughter (2004) describes these networks as a key feature of 21st century governance, arguing that the international system is not only one of formal relationships among sovereign states, but also one of less formal links among public, private, and non-profit entities that interact with each other on the basis of expertise and interest rather than formal power. These networks rely heavily on informal interaction, persuasion, and information to deal with critical areas such as security, the global economy, and environmental protection. Several authors have discussed these networks conceptually and argue the possibilities of empowering them to build governance capacity around the world (Betsill & Bulkeley, 2004; Raustiala, 2002; Setzer, 2009; Slaughter, 2004). However, little research addresses empirically the complexities surrounding the knowledge and information sharing that represents the main processes in these networks. This paper begins to fill this gap by exploring the concepts, relationships, and processes embodied in knowledge and information sharing in transnational networks and offering a framework that can guide empirical study.

The structure of these networks can be vertical or horizontal (Slaughter, 2004). The main goal of vertical networks is to align national and supranational rules through different modes of enforcement, while horizontal networks rely on knowledge and information exchange to help build capacity to develop and comply with global rules and policies. Vertical government networks are the traditional form, but horizontal networks are the usual structure for linking salient actors in a disaggregated world. Hence, the main structural feature of the networks we explore in this paper is a set of horizontal linkages among government agencies and officials in different countries. These networks involve organizational units within different countries below the level of the state. They can involve individuals at the highest ministerial levels who are directly responsive to national political processes as well as regulators and experts in lower level positions. Given this arrangement, the networks tend to be less formal and more flexible than is possible when working in official channels. Consequently, the information and knowledge exchange process can be richer, but it can also be more complex as it may contain different types of content (including knowledge, information, and technology) exchanged in a variety of ways across national borders and among individuals, groups, and organizations.

Many such networks exist today, for instance, as part of a complex global environmental protection governance structure. Examples in this domain include the environmental enforcement network created by US, Mexican, and Canadian environmental agencies as part of

* Corresponding author.
 E-mail addresses: sdawes@ctg.albany.edu (S.S. Dawes), mgharawi@ctg.albany.edu (M.A. Gharawi), bburke@ctg.albany.edu (G.B. Burke).

North American Free Trade Agreement (NAFTA). In the collaboration between the US Environmental Protection Agency (EPA) and the Mexican Secretariat of Environment and Natural Resources (SEMAR-NAT), the agencies exchange information related to their existing policies in order to assess monetary penalties in administrative enforcement procedures as well as for criminal environmental enforcement. They exchange statistics on enforcement activities and accomplishments to identify gaps in methodologies and capabilities. Additionally, they meet regularly to exchange information on cross-border pollution issues. Moving from regional to global scale, the International Network for Environmental Compliance and Enforcement (INECE) founded by the EPA and the Dutch Ministry of Housing, Special Planning and Environment offers technical assistance, training, global conferences, and a website of information to aid environmental agencies worldwide to deal with environmental protection issues (Raustiala, 2002).

While these networks are established for a specific purpose such as capacity building, technical assistance, or harmonization of standards, once agencies begin to collaborate their goals are often extended to address additional issues that were not planned when the networks were initiated. Generally, if they reach a requisite level of trust, participants look for additional ways to benefit from the collaboration. Consequently, the exchange of knowledge and information in these networks can be conceptualized as a process that unfolds over time. For example, in the collaboration between EPA and SEMARNAT, the relationship began with technical assistance to Mexico through training activities to establish a largely US-trained environmental enforcement office. As the relationship evolved, the collaboration extended to joint projects to improve air quality along the US–Mexico border such as the design and construction of new brick kilns in Ciudad Juárez, Mexico. These brick kilns were capable of reducing emission of carcinogenic and other toxic compounds in the border region by over 80% compared to the traditional kilns in use at the time (Cresswell, Burke, & Navarrete, 2009; Curry & Pumfrey, 2006).

Finally, these networks and practices are expandable. When they succeed in achieving desired goals, these largely governmental networks become more attractive to participants from other sectors or nations either to imitate or to join. In the brick kiln example above, a university and large and small businesses joined with national, state, and local government agencies to develop a mutually beneficial solution to one of the most serious air quality problems in the area. Raustiala (2002) points to another example in the emergence of INECE that began in 1985 with a Dutch request for technical assistance from US EPA. A similar request from Poland in 1991 was followed by a number of others. As EPA attempted to respond to a growing number of requests, it began to organize international conferences and created a website for streaming videos as ways to organize and share knowledge and information among regulators worldwide.

This paper reflects on a current research effort to analyze specific experiences of government and partner organizations in the United States, Mexico, and China as the basis for both conceptual models and practical tools for effective transnational knowledge sharing. We focus on transnational public sector knowledge networks in air quality monitoring and improvement, an area with significant domestic and international impact. The research addresses these questions:

• What are the main characteristics of these networks?
• How do participants perceive their roles, goals, and performance?
• What are the factors that may promote or hinder their success?
• Which strategies, tools, and behaviors are more likely to lead to successful transnational knowledge networks that benefit individuals, organizations, and communities?

We are exploring these questions in two case studies, one in North America and one in Asia, as vehicles for identifying and understanding the factors that shape transnational public sector knowledge

networks (TPSKNs). Our research is also building, testing, and refining a methodology for conducting such work in more depth in the future.

The North American case involves the Joint Advisory Committee for the Improvement of Air Quality in the Ciudad Juárez, Chihuahua, El Paso, Texas, and Doña Ana County, New Mexico Air Basin (JAC) (JAC, 2010). The JAC was formed in the 1990s in response to concerns about poor air quality in this US–Mexico border region. This network comprises members representing all levels of US and Mexican governments as well as academic researchers, industry, and environmental advocacy groups. Since the network's inception, the partners have worked collaboratively to share knowledge and information in an attempt to collectively address air pollution problems that span the border region. The JAC has influenced national, federal, state, and local air quality policies as well as facilitated joint US and Mexican projects that have reduced air pollution in the region. This initiative constitutes an operational transnational knowledge network (Cresswell et al., 2009).

In the second case, a network is emerging in relationships involving the United States and China. This initiative, known as AIRNow-International (AIRNow-I) Shanghai, involves the US EPA, the Shanghai Environmental Monitoring Center (SEMC), and several other US and Chinese partners. The AIRNow-I Shanghai initiative is based on the US AIRNow program that provides the US public with easy access to air quality information for over 300 cities via a publicly available website. It also disseminates information to the media and other outlets including *USA Today* and the Weather Channel (AIRNow, 2010). The AIRNow-I program represents US EPA's efforts to update and enhance AIRNow in collaboration with international partners and is linked to an international voluntary effort to create worldwide sharing of data about the Earth and its environment, called the Group on Earth Observation (GEO). Shanghai is the first international partner in this initiative. Over the past 4 years, US EPA and its main contractor Sonoma Technology, Inc.; SEMC; and other partners have worked closely to revamp the US AIRNow software for international application. The launch of the new Shanghai air quality reporting system occurred in May 2010 as part of the Shanghai World Expo. Because the AIRNow-I Shanghai effort is at an earlier stage of collaboration than the US–Mexico JAC initiative, it offers an opportunity to observe and analyze it as it develops.

The research team involves researchers who are native to each country to allow for working in multiple languages and to provide better understanding of the situations and norms prevalent in the participating organizations. The research data consist of documentary evidence and two dozen interviews with individual members of these organizations. The interviews focused on transnational knowledge and information sharing from the point of view of each organization, country, and culture. The case data will be analyzed according to the preliminary framework presented in this paper.

In the next sections we present the conceptual basis for an integrated framework to assess the contextual dimensions of TPSKNs. We start by identifying the main characteristics and processes embedded within TPSKNs. The paper then discusses the contextual factors that affect the individual participating organizations as they relate to three layers of complexity: information and knowledge context, organizational context, and the national contexts where the interaction takes place. We then discuss contextual "distances" that exist when organizations in different countries interact. This discussion is grounded in the literatures of knowledge transfer (KT), cross-boundary information sharing (CBIS) and public sector knowledge networks (PSKN). The paper concludes with an integrated conceptual framework and a discussion of the next phases of our research.

2. Defining and understanding TPSKNs

This section draws on research on cross-boundary information sharing and integration, public sector knowledge networks, and