

Local communities and researchers working together for water security: A multi-actor dialogue in Saskatchewan, Canada

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Key Messages

- Multiple knowledge systems, from local to global, can be integrated through collaborative planning and dialogue among diverse actors.
- Including local/Indigenous customs is important for meaningful collaboration.
- Face-to-face dialogue is essential; it both broadens and deepens collaboration among diverse actors.

This article reports and reflects on the implementation of a workshop we jointly organized in Prince Albert, Saskatchewan in May 2016, with a theme of community-researcher collaboration in water security. Through the planning, implementation and reflection processes, several lessons were learned including the following three points. First, integration of knowledge at various scales was observed from the planning stage, where local actors provided knowledge on the severe issues at the local scale, while actors visiting from outside proposed a general framework for discussion. Both were important types of knowledge. Second, local customs adopted in the workshop played an important role in facilitating dialogue. They included respect to the Indigenous leaders and their perspectives, and the use of local foods catered for the lunch that were local products with connections to the workshop theme of water security. Third, a strong interest in the theme of the workshop helped to strengthen connections among participants. While there had been collaborations between some of the participating actors prior to the workshop, most of these had been indirect and/or bilateral. The workshop created one arena where a broader set of actors met in one room to have deep discussions to foster relationships for future work together.

Keywords: collaborative planning, water security, integrated knowledge systems, participatory discussion

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Introduction

Thirty people participated in a one-day workshop, titled *Water Security Workshop: Interactions between Communities and Scientists*, on May 3, 2016 at the Saskatchewan Forest Centre in Prince Albert, Saskatchewan, Canada. The purpose of this workshop was to bring together people of different standpoints, allowing them to share their own experiences of society-science interaction with respect to water security, and to consider how actors in local communities and researchers could work together to address water security. The workshop had a good balance of participant composition in terms of age, gender, and occupation. Both academic researchers and practitioners participated.

The workshop was hosted jointly by Prince Albert Model Forest (PAMF; <http://www.pamodelforest.sk.ca/>), Redberry Lake Biosphere Reserve (RLBR; <http://redberrylake.ca/>), the North Saskatchewan River Basin Council (NSRBC; <http://www.nsrbc.ca/>), the University of Saskatchewan's School of Environment and Sustainability (SENS; <http://www.usask.ca/sens/>), and the Integrated Local Environmental Knowledge (ILEK) Project (<http://en.ilekcrp.org/>) of the Research Institute for Humanity and Nature located in Kyoto, Japan. The authors of this review represent these host organizations.

The ILEK Project worked together with PAMF, RLBR, and SENS in Canada, and with many other collaborators around the world, investigating the mechanisms of adaptive governance in complex social-ecological systems. The project aimed to produce a body of knowledge about governance for sustainability that is practical and innovative. It presumed the importance of “knowledge translators,” who bridge gaps between multiple actors such as local residents, government officials, and researchers (Sato et al. 2018). In the processes of co-production and use of ILEK, new interpretations and meanings are added so that the knowledge is adapted, or translated, to the local contexts and becomes sharable by diverse actors. The project attempted to document and visualize the processes in which translated and shared knowledge promotes collaborative action against local issues (Kitamura et al. 2018). As part of its action-based research design, the ILEK Project organized similar workshops in Kyoto (Japan), Sarasota (USA), and Suva (Fiji), where local participants engaged in dialogue on society-science interactions in specific contexts, such as coastal restoration and resource management.

For the workshop in Saskatchewan, the local hosts proposed that water security and source water protection be the topic of discussion, because it is an on-going concern in the province. Many factors affect water security and source water protection, including increasingly variable precipitation patterns that can yield extreme impacts such as drought in one year and flood in the next. These are complex issues that require collaboration between diverse research and resource management organizations, including governments.

The workshop program and highlights

The workshop started its morning segment with opening prayer and remarks by one of the Indigenous participants. This was followed by a round of quick self-introduction by everyone present. A keynote presentation by a water modelling scientist Zilefac Elvis Asong set the context for the workshop. Then, the participants moved to smaller rooms for their first round of breakout discussions, sharing past experiences of community-researcher interactions. After this session, lunch was provided by the hosts, featuring northern pike and wild rice. Both are produced in the watershed, making the participants not only enjoy the local delicacy but also think of the importance of clean water and sustainable social-ecological systems. After the lunch, the breakout discussions in the smaller groups continued, entering the second round to talk about how local communities and researchers can work together to address water security. Later in the afternoon, everyone gathered again in the larger room for the final plenary session to share the summaries of the four groups. The workshop concluded with closing remarks, and the participants filled in a questionnaire before leaving the venue. This was the program of the day.

In his keynote presentation, Asong first pointed out that water security is a global concern. The UNESCO's International Hydrological Programme defines water security as “the capacity of a population to safeguard access to adequate quantities of water of acceptable quality for sustaining human and ecosystem health on a watershed basis, and to ensure efficient protection of life and property against water related hazards—floods, landslides, land subsidence, and droughts” (UNESCO-IHP 2012, 1). An important message is that both quantity and quality of water matter to ensure that the needs of human consumption and well-being are fulfilled.

Asong then showed a list of water security issues in the Saskatchewan River Basin. It is reported that the health risk from drinking water contamination is being faced by 90% of the Indigenous people in the province. An example is tap water contamination with parasitic *Cryptosporidium* in North Battleford in central Saskatchewan in 2001, which reportedly caused health problems for up to 7000 people, including approximately 700 people who were eventually compensated by the provincial and municipal governments. Water security issues in the province also include floods and droughts (Figure 1), with the former occurring several times in the past destroying many properties, and the latter causing billions of dollars of damage to agriculture. The Canadian prairies have always been subject to extreme events related to water, but the threats have become greater due to socio-economic factors such as population growth and economic development, coupled with environmental factors such as warmer climate resulting in variable water supply from glaciers in the Rocky Mountains (Gober and Wheeler 2014). The keynote talk concluded by pointing out the importance of communication between scientists and local communities, to which this workshop could contribute.

Breakout discussions in four groups of six to seven people were facilitated by graduate students of SENS who had received



Figure 1
Many roads in Saskatchewan, like this one in Hafford, were flooded in 2014
Photography: Kenji Kitamura, August 28, 2014

training in facilitation. All the groups had active discussions with diverse views expressed. For example, the issue of water allocation was raised in one group, emphasizing the complexity of water allocation mechanisms. In addition to the trade-offs between quantity available for farms, livestock or humans, the quality for one user group is affected by another. Cow droppings on the snow, for example, easily run into the river, causing water pollution which is hazardous for human consumption. With respect to the floods in recent years due to heavy rains, the elder of an Indigenous community represented many people in the entire watershed sharing the same sentiment by saying: “We took water for granted for quite some time until we had these different emergencies.”

There were also comments on community-science interactions. For example, it was pointed out that scientists should communicate better and more creatively to make the meaning of their research understandable; they should also target broader groups of people in the community. Another problem raised was insufficient cooperation between different agencies of the government. One participant also mentioned the different attitudes among municipal administrators towards environmental hazards that resulted in different levels of readiness and thus different levels of damage when a flood occurred. There were data available to describe the hazard but these had not informed policy. Another comment was that a facilitator is needed to promote interaction among different groups, one who can communicate in a language understandable and relatable to all groups. Scientists in this sense should have a responsibility of knowing the people and their needs, according to another group of breakout discussions. For reciprocal learning, skills such as trust building and listening were considered to be important. Because problems are complex in reality, no single scientific approach would

solve them; practical and combined methods were considered necessary for problem solving.

“Community champions” and “community ambassadors” were the words that several people mentioned during the workshop. They can be dedicated leaders who connect scientists with community, and who understand the social issues that are often more severe than the environmental issues. Such leaders would also connect the communities with industries and government. All of these comments are just a few examples of the rich discussions during the workshop.

There was one elder from an Indigenous community, who acts usually as a listener rather than a speaker in official meetings. He started to draw a map on a white board during the breakout discussions, to describe the water issue in the area (Figure 2). It was about water regulation with a dam, a source of conflict between different groups of residents such as cabin owners and animal trappers. The facilitator of his group and the workshop organizers tried to have a computer connected to the Internet so that a digital map could be accessed online and used to assist the description. Unfortunately, the connection was not successful. However, his hand-drawn map worked as an effective tool, which showed his perspective on the area and its water issue. What was drawn (and what was not) indicated meanings in themselves, so the lack of Internet connection was a fortunate thing in a sense. The group facilitator noticed the value of this map, so the participant was invited to share the map and his explanation with the larger group. This was one moment that demonstrated the benefit of actually getting together to share diverse viewpoints.

Quotes from the questionnaire

We asked all the participants to provide comments through the questionnaire, which we considered to be another round of learning mutual insights. Here are some examples. One participant listed key points for community-researcher collaboration: “Demonstrating success stories from other communities; good facilitators who can bridge gaps between people and bring them together; make sure to incorporate local knowledge and aspirations in selecting options with local participants.” Another pointed out: “Scientist must get to know the issue but also the community. Be upfront with what will be involved and what the community can expect with the research that will be done.”

There were suggestions about the processes and mechanisms of collaboration. One participant emphasized the importance of trust building by listing key points as: “Communication strategies; ‘connections,’ such as champions and enabling policies and approaches that bring people together; time to build relations; respectful communication.” With respect to the issue of how to sustain activities, particularly after a certain collaborative project comes to an end, one opinion was expressed from an Indigenous community’s perspective: “Local leader or community champion is critical for work to continue during and after field visits and after project completion.” The key point raised by one participant read: “Mechanisms in understandable language that



Figure 2

An Indigenous elder shared his view of the water security issue with his group members by hand-drawing a map
Photography: Kenji Kitamura, May 3, 2016

the community has helped develop and can take ownership of. Without ownership, you cannot expect uptake.”

A comment was made about the local community’s efforts that “if the issue is important to the community, one should hope the community would ensure that their message is effectively communicated,” rather than just passively dependent on government support.

The types of scientists who would be helpful to local communities were defined by a local community member as “Scientists who familiarize themselves with community concerns and issues before proposing research or solutions. Scientists who advocate a collaborative approach to research with other scientists and members of the community.” One participant mentioned the need to acknowledge diverse knowledge of diverse people: “Understand that everyone is expert in their own right.”

There was a comment on the benefits of the workshop: “I think the various discussions and perspectives were very stimulating and engaging. Workshops like this do add a lot to our knowledge base.” One undergraduate student commented from a perspective of a younger generation that “having knowledge from research ‘elders,’ members of the community, and liaisons from the community made this workshop incredibly valuable for future work and research.”

Reflections

A one-day workshop does not solve the problem of water security. Nor does it secure long-term collaboration. However, it is reasonable to conclude that one of our main purposes of connecting people from diverse standpoints was realized. This owes

largely to existing networks of the local hosts. Prince Albert Model Forest has a board of directors represented by diverse groups in the area, which served as the basis of the invitees list. Redberry Lake Biosphere Reserve and the North Saskatchewan River Basin Council also work with important actors in the watershed, adding more names to the list.

The workshop discussed the local context of water issues in relation to a universal theme of community-researcher collaboration. It was both local and international, with the keynote speaker originally from Cameroon, and the first author of this paper a visiting researcher from Japan. The facilitators in breakout discussions were all international graduate students originally from Colombia, Ecuador, and Ghana. This diversity contributed to a broadening of perspectives.

There were valuable tips provided in the planning stage of the workshop by a researcher, who was absent from the workshop but had been working closely with many local communities, including Indigenous groups, to address water security issues. His tips for effective collaboration included: a need for local stories and traditional knowledge for water to be incorporated into planning; inclusion of both elders and youth in the planning process; adhering to local protocols in plan making such as opening prayers and meals; identification of a plan champion in the community to lead and coordinate the committee; early clarification of the plan’s legitimacy; and sharing of the draft plan in a number of venues such as health centres, schools, and councils. Many of these points were actually mentioned by the workshop participants, and also adopted in the planning of the workshop itself. Because future action depends on younger generations, youth participation in the dialogue and knowledge translation is important (Garinger et al. 2016).

One conclusion we might all agree on is the important role played by a representative, or a champion, in each of the various groups involved in the specific local issues. This does not mean there is a single model for such a person. Each person can be a champion based on her/his unique talent (Reed et al. 2015). Where a process of collaboration by people with different talents receives skilful facilitation, knowledge from diverse sources can be translated, combined, and used to prompt action against the issues.

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