

RESEARCH CONNECTION

Achievements of Emerging Leaders in the Americas Program (ELAP) students from Brazil at Brandon University

By Etsuko Yasui, PhD, & Balfour Spence, PhD



Why this research is important

Dams are one of the oldest structural engineering designs in the world and provide numerous social and economic benefits—electricity, mineral extraction storage, industrial and agricultural irrigation, water supply, sports and recreation, and flood control. In spite of these positive and beneficial contributions, dams can have negative and even devastating social and environmental consequences resulting from structural failures, design flaws and regulatory inadequacies. The devastation wreaked on local communities and mine workers by the recent failure of two mine-tailing dams in Brazil points to the need to revisit the structural and regulatory designs of dams in order to effect disaster risk management measures for social protection. Further, these events highlighted the need to balance the benefits of dams

What you need to know

In 2019, the Department of Applied Disaster and Emergency Studies (ADES) applied for the Emerging Leaders in the Americas Program (ELAP) scholarship delegated by the Office of International Activities to work with students from the Federal University of Latin American Integration (UNILA), Brazil. Our interest was in working with Brazilian students with a background in natural resource management, engineering, or environmental studies. Our research engagement centred on better understanding the dynamics of two mine-tailing dam disasters that occurred in Brazil (Mariana in 2015 and Brumadinho in 2019). Lucca Grzeczeczen-Gonçalves, Samanta Klering, and Deborah Nardi were awarded the scholarship provided by Global Affairs Canada in 2020 to conduct research over a six-month period with Dr. Etsuko Yasui and Dr. Balfour Spence.

with the need to protect communities and ecosystems in their proximity to ensure a more equitable distribution of risk.

How the research was conducted and findings

Travel restrictions and delays resulting from the COVID-19 pandemic delayed the arrival of the students at Brandon University and the start of research activities until January 2021. Although pandemic isolation policies meant that

researchers could not physically interact for two weeks and despite the virtual operation mode of the Brandon University Campus, students and professors were able to successfully discuss, design and execute research projects using MS Teams and other remote learning platforms.

Under supervision from the professors, each student designed and executed a research project related to building disaster resilience capacities to mitigate the occurrence of and impacts from dam failures. Conduct of the research utilized resources from the Brandon University Library databases, UNILA databases and Canadian government documents. Papers generated from this research were submitted and accepted for presentation at the 2021 Canadian Dam Association virtual conference in October 2021.

Lucca's research—*Enhancing dam risk management in Brazil: A preliminary review of Brazilian dam operations impacts: Lessons learned from dam projects*—discussed the afore-mentioned mine-tailings dam disasters that were the results from poor regional planning, relaxed environmental regulations, economy-driven development, and a lack of local communities' emergency plans and protective policies.

Deborah's research—*Contributions of Brazilian dam management to global technological transitions in dam safety*—analyzed the backdrop of the historical evolution of Brazilian dam construction and the advancement of technology focused on securing higher energy sources that promise higher levels of economic gains, often at the expense of social welfare and equity.

Samanta's research—*Building a comprehensive database for enhanced dam risk management in the province of Manitoba, Canada*—involved a review and enhancement of the dam database in the province of Manitoba to provide a more comprehensive assessment of related risks and facilitate appropriate risk mitigation/management planning.

About the researchers

Lucca Grzeczeczen-Gonçalves (ELAP student researcher), Master of Civil Engineering, Federal University of Latin American Integration (UNILA).

Samantha Klering (ELAP student researcher), Bachelor of Civil Engineering of Infrastructure, Federal University of Latin American Integration (UNILA).

Deborah Nardi (ELAP student researcher), Bachelor of Civil Engineering of Infrastructure, Federal University of Latin American Integration (UNILA).

Dr. Balfour Spence is a professor in the Department of Applied Disaster and Emergency Studies at Brandon University. Spenceb@brandonu.ca

Dr. Etsuko Yasui is an associate professor in the Department of Applied Disaster and Emergency at Brandon University. Yasui@brandonu.ca

Keywords

Disaster and emergency management, dam safety and risk, dams in Manitoba, mine tailing dams in Brazil, dam failures, history of mega dam projects

Acknowledgements

We would like to thank the ELAP scholarship provided with the support of Global Affairs Canada. We would also like to thank the Office of International Activities at BU and UNILA (Foz do Iguaçu, Paraná, Brazil) for their assistance in the application process. And finally, thank you to the BU campus community for welcoming international students, especially during the pandemic.

Research Connection is a periodical publication intended to provide information about the impact of Brandon University's academic research and expertise on public policy, social programming, and professional practice. This summary is supported by the Office of Research Services, the Centre for Aboriginal and Rural Education Studies, and the federally funded Research Support Fund.

Editor: Christiane Ramsey Ramseyc@brandonu.ca
<http://www.brandonu.ca/research-connection>

BRANDON UNIVERSITY

Brandon University, founded in 1899, promotes excellence in teaching, research, and scholarship, and educates students so that they can make a meaningful difference as engaged citizens and leaders. This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License. Thank you to ResearchImpact-RéseauImpactRecherche (researchimpact.ca) for their permission to adapt the ResearchSnapshot clear language research summary format.

