

Framing a University Research & Innovation Strategy Around the SDGs: a Case Study

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Abstract

The United Nations' Sustainable Development Goals (SDGs) serve as a broadly-recognized, internationally-agreed framework for tackling the world's most serious problems. The challenges posed are global in scope, highly complex, inter-related, and will be best achieved through collective, cross-sectoral efforts. In a joint statement issued in July 2019 to the UN High-Level Political Forum on Sustainable Development,¹ the world's largest university associations – the Association of Commonwealth Universities (ACU), Francophone University Association (AUF) and International Association of Universities (IAU) – proclaimed that none of the seventeen Goals can be achieved without the contribution of higher education and research.

This paper will focus on the response of one Canadian research-intensive postsecondary institution, Dalhousie University, to this challenge: it has grounded its institutional Research and Innovation Strategic Direction for 2018-23 in the SDGs. Each of the University's five identified Strategic Research Clusters and two Cross-Cutting Themes are linked to particular SDGs. This focus allows Dalhousie – and indeed, could allow any university – to maximize the effectiveness of its research and innovation efforts, by leveraging its greatest research strengths to partner with others globally, and thereby work towards solving some of the most complex issues facing humanity.

This paper will describe the process by which Dalhousie came to frame its research direction around the SDGs, how it is monitoring its institutional progress towards achieving them, and the strategies being employed to encourage its personnel to align their research efforts with the Goals, while collaborating locally, nationally and internationally. Data-gathering methods highlighted will include faculty surveys, use of bibliometric keywords, and participation in exercises such as the Times Higher Education (THE) Impact Ranking. Fostering of inter-sectoral efforts will also be critical, across academia, government, non-profits and industry, in order to achieve greater impact. Closer integration of such efforts are now more important than ever, with the current COVID-19 pandemic presenting an opportunity for the human family to act in global solidarity and turn this crisis into an impetus to achieve the SDGs.

¹ <https://www.iau-hesd.net/en/actions/4846/iau-acu-and-auf-joint-statement-higher-educations-essential-contribution-sdgs>

Introduction

Dalhousie University is a comprehensive, post-secondary educational institution with a broad mandate to serve Nova Scotia, Canada, and the world through activities that integrate research, scholarship, teaching and service. Founded as a non-denominational institution in 1818 in Halifax, Nova Scotia, it recently celebrated two centuries of academic excellence. As the largest university in Atlantic Canada, it offers more than 200 undergraduate, graduate and professional degree programs to over 19,000 students.

Dalhousie is a member of the U15 group of Canada's most research-intensive universities; in the 2019/20 fiscal year, its researchers attracted over C\$181 million in external research funding. The Office of the Vice-President Research and Innovation (OVPRI) and its constituent units support the university in its continued growth as a hub of research and innovation, adding to the intellectual, social and economic capital of its communities. The university's research and innovation initiatives are driven by the values of:

- Responsible conduct of research
- Collaborating across disciplines
- Training the next generation of researchers
- Mobilizing knowledge to sustain change
- Partnering with the world

Equity, diversity and inclusiveness (EDI) are firmly implanted within Dalhousie's strategic priorities. The university has introduced a wide-reaching Diversity & Inclusiveness Strategy, which includes initiatives focused on employment equity.

Development of Strategic Direction for Research and Innovation

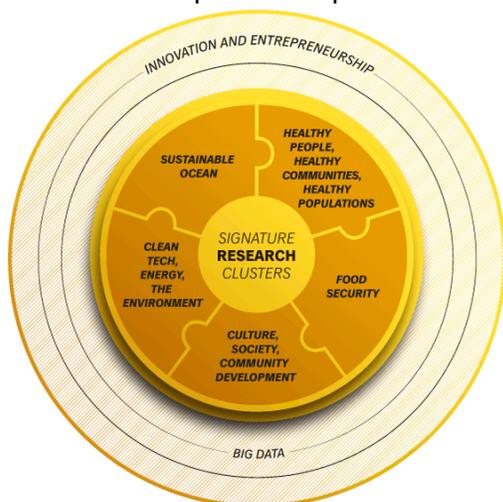
In early 2018, the OVPRI launched a consultative process to support the creation of a new Strategic Direction intended to guide the university's research and innovation activities over the next five years. Over a period of several months, nearly two hundred faculty and staff participated in a series of impact sessions designed to elicit feedback on the new direction; these sessions were supplemented by twelve external consultations and a survey of the university community in which nearly three hundred additional researchers and research staff participated.

The end result was *Impact Together*, the university's Strategic Direction for Research and Innovation, launched in September 2018 and intended to cover the period 2018-23. It identified the locus of Dalhousie's research strength within five Signature Research Clusters:²

- Sustainable Ocean
- Healthy People, Healthy Communities, Healthy Populations
- Clean Tech, Energy, the Environment
- Culture, Society, Community Development
- Food Security

² <https://www.dal.ca/research/SignatureResearchClusters.html>

The Signature Research Clusters are informed by two cross-cutting themes:³ Big Data and Innovation & Entrepreneurship.



Uniquely among Canadian research-intensive universities, Dalhousie’s Research and Innovation Strategic Direction is explicitly grounded in the SDGs,⁴ which are serving to focus Dalhousie’s global research efforts and help facilitate cooperation and collaboration across national boundaries, providing opportunities for partnership. Having aligned the Strategic Direction with the same goals to which leaders from around the world have committed, Dalhousie is able to leverage its greatest research strengths to partner with others around the globe, and focus efforts on solving some of the most complex global issues of this century.

Throughout the 2018 consultative process that informed the Strategic Direction, a question raised continually by Dalhousie’s research community was, “How do we know we are solving the world’s greatest problems, and who decides what those problems are?” This question compelled the leadership team to think more deeply about what kind of framework strategy would allow the Dalhousie research community to ensure their work had relevance locally, nationally and globally. It soon became apparent that the UN SDGs provided the ideal framework around which to devise the University’s approach. The suggestion to ground the Strategic Direction in the SDGs was received enthusiastically by the Dalhousie research community, which continues to rise to the challenge of working collaboratively towards solutions that no one scientist, institution or nation can solve alone.

As detailed below, each of the Signature Research Clusters and cross-cutting themes has been mapped to particular SDGs on which Dalhousie research in that Cluster impacts most strongly.

❖ *Signature Research Cluster: Sustainable Ocean*



SUSTAINABLE OCEAN



Dalhousie is a world leader in ocean research.⁵ Its multidisciplinary approach and leadership in international research initiatives including the Ocean Frontier Institute (OFI),⁶ the Ocean Tracking Network (OTN),⁷ the Marine Environmental Observation, Prediction and Response

³ <https://www.dal.ca/research/SignatureResearchClusters/CrosscuttingThemes.html>

⁴ <https://www.dal.ca/research/SolvingComplexGlobalIssues.html>

⁵ <https://www.dal.ca/research/oceanpower.html>

⁶ <https://oceanfrontierinstitute.com/>

⁷ <https://oceantrackingnetwork.org/>

(MEOPAR)⁸ Network, and others allows Dalhousie researchers to contribute to the most pressing ocean challenges of our time.

Dalhousie's flagship initiative, the OFI, brings together experts from both sides of the North Atlantic to explore the vast potential of the world's ocean.⁹ It is a transnational hub for marine research, exploring the ecosystems of the North Atlantic and Canadian Arctic Gateway to discover innovative solutions that strengthen the economy and protect the environment. OFI works with domestic and international governments and intergovernmental organizations to translate research results into public policy. Through education, training, and communication and by sharing talent, resources, and information, OFI generates ocean knowledge and opportunity, directly in support of SDG14 (Life Under Water).

❖ *Signature Research Cluster: Healthy People, Communities, Populations*



**HEALTHY PEOPLE,
HEALTHY COMMUNITIES,
HEALTHY POPULATIONS**



From world-leading vaccine research to the investigation of the social, cultural and environmental determinants of health and wellness, Dalhousie's approach to health research is grounded in an understanding that the health of individuals, communities and populations are interconnected and interdependent.

The Canadian Center for Vaccinology (CCfV) is an integrated, interdisciplinary vaccine research team, comprised of researchers from Dalhousie University and its teaching hospitals. It was established in 2007 to develop, implement, and evaluate vaccine technologies and vaccines for infectious diseases that have a significant impact on Canadian and global health, and to train experts in these critical and evolving fields. Most recently, its members are working with a Chinese manufacturer to run clinical trials on a potential vaccine for COVID-19. CCfV unites the biomedical and clinical sciences with the social sciences and humanities to effectively span the research continuum from basic discovery to translation into useful vaccines to prevent disease in humans and to change population and public health outcomes. In its work, the Centre directly supports SDG3 (Good Health and Wellbeing).

❖ *Signature Research Cluster: Food Security*



FOOD SECURITY



⁸ <https://meopar.ca/>

⁹ <https://oceanfrontierinstitute.com/research>

Access to sustainable, secure food resources poses challenges and creates instability around the globe. Dalhousie researchers are creating solutions that emerge from a deep understanding of local food issues—and that provide potential solutions for global food challenges.

Dalhousie's Food Policy Lab,¹⁰ led by Dr. Catherine Mah, studies how the community food environment and related policies affect people's consumption and diets. The lab's work focuses on key themes, including healthy food retailing (learning about the best ways to make buying food a healthy and rewarding experience for eaters and retailers); health equity and resource distribution (studying the level of material deprivation that occurs when households have inadequate income to access food) and food and policy participation (promoting information sharing and transparent public processes, and encouraging rigorous evidence-informed debate on the food, nutrition, and health issues that matter most to communities). Given that diet-related causes are the leading driver of the global burden of disease, the Food Policy Lab's work contributes directly to SDG2 (Zero Hunger), SDG3 (Good Health and Wellbeing), SDG10 (Reduced Inequalities) and SDG12 (Responsible Consumption and Production).

❖ *Signature Research Cluster: Culture, Society, Community Development*



CULTURE, SOCIETY, COMMUNITY DEVELOPMENT



How does social justice define what we do? What is the future for rural economies? What can we do to amplify marginalized voices? How can digital media be harnessed to create community? These are just some of the questions being tackled by Dalhousie researchers, as they use their research to inform our most pressing conversations about culture and community.

The Rural Futures Research Centre¹¹ at Dalhousie University, headed by Dr. Karen Foster, Canada Research Chair in Sustainable Rural Futures for Atlantic Canada, explores what is happening in independent, family-owned enterprises in rural communities, what is at stake in their survival, and what, if anything, should be done – particularly in terms of progressive policy responses to rural depopulation and occupational succession. The Centre's work supports SDG8 (Decent Work and Economic Growth), SDG9 (Industry, Innovation and Infrastructure) and SDG11 (Sustainable Cities and Communities).

❖ *Signature Research Cluster: Clean Technology, Energy, the Environment*



CLEAN TECH, ENERGY, THE ENVIRONMENT



¹⁰ <http://catherinemah.ca/>

¹¹ <https://rffc.ca/>

Managing and developing new and renewable energy resources while minimizing their environmental impact is one of the world's most serious challenges. Dalhousie is a national and international leader in advanced materials and clean technology research, with exceptional researchers developing products (in particular, batteries) that improve performance, productivity and efficiency while at the same time reducing costs, energy consumption and waste.

The world-class research taking place in the Dahn Lab¹² at Dalhousie, led by Dr. Jeff Dahn, focuses on the physics and chemistry of materials for energy storage, primarily in the area of lithium-ion batteries. The Lab's industrial sponsor is Tesla Motors, the world leader in electric vehicles and energy storage products. Dr. Dahn is recognized as one of the pioneering developers of the lithium-ion battery that is now used worldwide in laptop computers and cellphones. The research being undertaken by the Dahn Research Group supports SDG7 (Affordable and Clean Energy), SDG9 (Industry, Innovation and Infrastructure), SDG12 (Responsible Consumption and Production), and SDG13 (Climate Action).

While Dalhousie's research and innovation efforts focus on five Signature Research Clusters, all of these are informed by two cross-cutting themes.

❖ *Cross-Cutting Theme: Big Data*



Dalhousie's expertise in the collection, use, analysis and interpretation of Big Data enables new opportunities for research, analysis and insight in all of the university's Signature Research Clusters.

❖ *Cross-Cutting Theme: Innovation and Entrepreneurship*



Dalhousie's strengths in innovation and entrepreneurship facilitate opportunities for collaboration between companies and university researchers and help drive the commercialization of research.

¹² <https://www.dal.ca/diff/dahn.html>

Strategies for Increasing Researcher Alignment With the SDGs

Grounding its Research and Innovation Strategic Direction in the SDGs served as a critical first step in Dalhousie's taking action, at institutional level, to support the global Goals. This alignment was welcomed by a core of Dalhousie researchers such as those profiled above, who are already very familiar with the SDGs and who see clear connections between the Goals and the work they do. Many more researchers are less clear about such links, however, and it was soon apparent that statements of policy alone would not be sufficient.

Throughout 2019, the OVPRI implemented a variety of strategies – described below – designed to raise the profile of the SDGs and bring their importance to the attention of all Dalhousie researchers, as well as encourage those who were unsure of the connections (or saw no connections at all) between their work and the Goals to think more deeply about possible linkages. These strategies are monitored regularly by OVPRI personnel, and reported upon annually with the Key Performance Indicators established for the Strategic Direction for Research and Innovation.

❖ Tracking SDGs as Keywords

Dalhousie's research administration software is used by all researchers in the process of submitting applications for external research funding. As part of the application process, researchers are required to input details of their research project and select keywords that best describe the research.

In May 2019, the software was programmed to include each of the 17 SDGs as potential keywords that could be selected by researchers. Reporting undertaken as of 1 April 2020 indicated that nearly one year after these keywords were made available, out of the 1,295 funding applications submitted in the system, 512 (or 39.5%) identified at least one SDG as relevant to the research project. This has been established as a baseline measure, and the OVPRI has established a target of year-on-year increases in this percentage.

❖ Annual Faculty SDG Survey

In spring 2019, the OVPRI designed and launched a survey to better understand how researchers at Dalhousie are engaging with the SDGs. Like the introduction of keywords, the survey was aimed at raising awareness among faculty of the importance of the SDGs to the university's Research and Innovation Strategic Direction. All faculty (including tenured/tenure-track, clinical appointments, instructors, limited-term faculty and Professors Emeriti) were invited to participate in this survey, which aimed to gather information about:

- what Dalhousie researchers are currently doing to engage with the SDGs (whether intentionally or not);
- how their research engages with the SDGs, and which of the Goals have the closest alignment with their research; and
- with which networks/organizations they are currently engaged and sharing information.

The survey¹³ was designed to take approximately 10-20 minutes to complete, and was open over a three-week period. Responses were anonymous and not linked to individuals (unless they chose to provide their names). Participation was completely voluntary, and each question about engagement with the SDGs was optional.

The survey was completed by 111 researchers, out of the more than 3,000 researchers eligible to participate. The most popular SDGs identified by researchers as having alignment with their work included SDG3 (Good Health and Well-Being), SDG10 (Reduced Inequalities), SDG11 (Sustainable Cities and Communities) and SDG13 (Climate Action).

The intention is for this exercise to be repeated annually, with the survey results being used to promote research at Dalhousie and inform the further development of the Research and Innovation Strategic Direction. The 2019 survey response has been established as a baseline measure, and the OVPRI has established a target of year-on-year increases in the number of researchers participating. In May 2020 the survey was relaunched and completed by 206 researchers. Full analysis of the results is now underway, but having participation in the exercise nearly doubled from the year before is a very positive result.

❖ *SDSN Canada Membership*

In summer 2019, Dalhousie University's membership in Sustainable Development Solutions Network (SDSN) Canada was approved.¹⁴ Housed at the University of Waterloo, SDSN Canada serves as the Canadian branch of the global UN SDSN and currently has 36 institutional members across the country.

By working closely with United Nations agencies, multilateral financing institutions, the private sector, and civil society, the SDSN aims to accelerate joint learning and promote integrated approaches that address the interconnected economic, social, and environmental challenges confronting the world. Through its participation, Dalhousie seeks to partner with like-minded researchers and institutions to expand the depth and breadth of how it engages institutionally with the SDGs.

❖ *Participation in Global Sustainability Rankings and Ratings*

In autumn 2019, Dalhousie participated for the first time in the Times Higher Education Impact Ranking, and received confirmation in April 2020 that it had ranked #85 among 767 institutions worldwide that participated that year. The Impact Ranking is the only global performance table that assesses universities against the SDGs, and provides balanced comparisons across three broad areas: research, outreach and stewardship. Dalhousie was one of nineteen institutions in Canada that took part, and the only university from Atlantic Canada.

Dalhousie's grounding of its Research and Innovation Strategic Direction in the SDGs, and the quality of its research across the seventeen Global Goals, undoubtedly contributed in very large part to its success in this exercise. A university's final score in the Impact Ranking is a measure of how well it is addressing the world's most pressing issues; top performance areas for

¹³ https://www.dal.ca/dept/research-services/opportunities/opportunities-announcements-news/news/2019/04/01/survey_on_researcher_engagement_with_united_nations_sustainable_development_goals.html

¹⁴ <https://www.dal.ca/news/2019/12/06/practical-problem-solving-for-sustainable-development.html>

Dalhousie included SDG14 (Life Below Water), SDG3 (Good Health and Wellbeing), SDG10 (Reduced Inequalities), and SDG17 (Partnership for the Goals).

In addition, Dalhousie has participated since 2011¹⁵ in the Sustainability Tracking Assessment and Rating System (STARS), administered by the Association for the Advancement of Sustainability in Higher Education (AASHE). STARS involves publicly reporting comprehensive information related to a college or university's sustainability performance, and it is aligned with and covers all seventeen SDG goals and indicators. Rankings are valid for a three-year period; Dalhousie's latest submission in April 2018 received a Gold rating.¹⁶

Conclusion

Dalhousie's decision two years ago to ground its Research and Innovation Strategic Direction in the United Nations' Sustainable Development Goals was born of a need to address researchers' concerns that the university's identified Strategic Research Clusters could be accurately characterized as some of the most critical issues facing people and planet. This institutional research strategy has since propelled Dalhousie towards closer alignment with external partners, allowing greater ease in collaborating with organizations outside academia who speak the same language of sustainable development. At the present time, such efforts are more important than ever, with the current COVID-19 pandemic presenting an opportunity for the human family to act in global solidarity, and turn this crisis into an impetus to redouble our efforts to achieve the SDGs.

¹⁵ https://www.dal.ca/dept/sustainability/about/Purpose/Strategic_Planning_and_Reporting.html

¹⁶ <https://reports.aashe.org/institutions/dalhousie-university-ns/report/>