

School of Environment, Enterprise and Development

ANNUAL REPORT

2023

Faculty of Environment  
University of Waterloo

## Introduction

This report covers the period from January to December 2023. The school has enjoyed ongoing success, with several highlights:

- SEED’s research funding from all sources remains strong, totaling approximately \$4.9 Million.
- SEED welcomed Amr ElAlfy and Rosella Care in 2023 and will welcome Julie Bernard in September 2024.
- Our students and faculty continue to work closely with a range of stakeholders, locally, nationally, and internationally, ensuring SEED’s continued visibility in research, teaching, and professional service (see Achievements and Impacts).

## SEED Enrollment Trends

At the aggregate level, the school’s enrolments have decreased over the past year compared to 2022. In the undergraduate programs, International Development has decreased by 14 students and Environment and Business has decreased by 77 students. The number of new students enrolled in the Bachelor of Sustainability and Financial Management (BSFM) has increased which there is now 73 students across the 3 cohorts. Looking ahead, the BSFM is expected to attract approximately an additional 300-400 students in total compliment over the next four years, resulting in enrolments well exceeding 1,000 undergraduate students per annum across all programs.

Year*	Undergraduate			Graduate					
Program	EB	INDEV	BSFM	MEDI	MEB	MDP	MES SUSM	PhD SUSM	Total
2022	538	55	46*	23	73	22	64	82	857 (903)
2023	461	41	73*	23	74	22	43	80	744 (817)
Change	-77	-14	+27	0	+1	0	-21	-2	-113

- Joint program with SAF

Graduate enrolments are down slightly from the previous year at 242 across all programs. In the three professional programs, MEDI and MDP has stayed the same and MEB has increased (+1). The MES in Sustainability Management has declined by 21 student (reflecting a large number of degree completions in that program) and the PhD in Sustainability Management has decreased by 2 students.

## Degree Completions

Year*	Undergraduate		Graduate					
Program	EB	INDEV	MEDI	MEB	MDP	MES SUSM	PhD SUSM	Total
2023	91	6	11	30	11	29	5	183

## **Faculty**

Amr El-Alfy and Rosella Care joined SEED in 2023. These appointments bring SEED's faculty compliment to 22 members. In addition, SEED has many Adjunct Professors; one Professor Emeritus; three affiliated faculty members who are appointed at St. Paul's University College and who teach in the school; post-doctoral fellows; a visiting scholar, many research associates; and several sessional instructors. Long time faculty member, Olaf Weber was offered the CIBC Chair in Sustainable Finance at the Schulich School of Business at York University and joined the faculty at York University in the Fall of 2023. His colleagues at SEED are immensely proud of Olaf's achievements and while we miss him greatly, we wish him good fortune in his new position.

## **Staff**

At the end of 2023, the school's administration team comprised of Jennifer Nicholson (Administrative Manager), Karen Robertson (U/G Advisor-INDEV/Administrative Assistant), Cheri Oestreich (U/G Admin-ENBUS), Jennifer Doucet (Grad Admin-MEB, MDP, MEDI), Anastasiya Saparaliyeva (Grad Admin-SUSM). Our staff do an amazing job supporting our students and our faculty.

## **Faculty Administrative Roles**

In 2023, the following faculty members held administrative appointments within the School and the Faculty:

- SEED Director (Interim) – Neil Craik
- Associate Director Undergraduate Studies, - Dan Murray
- Associate Directors Graduate Studies - Jason Thistlethwaite and Heather Hall
- Co-Director, BSFM, SEED - Jennifer Lynes
- Program Academic Directors:
  - MEDI: Sean Geobey (Jan – October) Heather Hall (October -current)
  - MEB: Goretty Dias (Jan - Aug), Komal Habib (Sept – current)
  - MDP: Larry Swatuk
- MDP Field Placement Coordinator – John Abraham
- Associate Dean, Work Integrated Learning – Mike Wood
- Associate Dean, EDIJ – Prateep Nayak
- Director, Waterloo Institute for Complexity & Innovation – Sean Geobey

## **Program Updates**

SEED houses 8 programs, comprising three undergraduate programs (International Development, Environment and Business, and the new Bachelor of Sustainability and Financial Management); three professional graduate programs (Master of Development Practice, Master of Economic Development and Innovation, and Master of Environment and Business); and two graduate research programs in Sustainability Management (MES and PhD). The PhD in Sustainability Management accepted its sixth cohort of students in September 2023 and had its second-degree completion in the program in 2023. The school continued the cyclical review process for all its programs (except the BSFM) in 2023.

## **Undergraduate Programs**

### **Environment and Business Program**

Now in its 22nd year, the Environment and Business Honours co-op program currently has more than 500 students, including students from Nanjing University of Finance and Economics (NUFE) who complete the final two years of their degree at UW through our 2+2 program. With a program-wide focus on advancing sustainability in practice, the highlight of the program for many students is the eight-month capstone project that they complete in their final year. Students work in teams with a 'real-world' client to address a specific sustainability issue related to the organization. The co-op employment rate for the ENBUS program is 95%.

### **International Development Program**

The INDEV Program continues to place students on eight-month field placements with World University Service of Canada partner organizations in the Global South as part of their Practice Specialization. Since 2012, the program has successfully placed more than 250 INDEV students with organizations abroad. Students also continue to opt to undertake their thesis research under the INDEV Research Specialization.

An ongoing challenge is the downward trend in INDEV enrollments, and the program is currently reviewing future pathways for the program. Consultations have taken place with students, alumni, professionals in the field, cognate programs at other universities, affected faculty and staff. This review is being conducted within the context of the cyclical review and other discussions regarding the direction of undergraduate directions in the School and Faculty. The school has closed the program to new admissions (commencing in 2024) pending the outcome of these discussions.

### **Sustainability and Financial Management**

The BSFM program was approved in 2021 and is jointly run with the School of Accounting and Finance. The program provides students interested in the fields of accounting and financial management with a program that balancing environment courses with standard accounting and financial management courses, with the core of the program focusing on the emerging practices in the sustainable finance and accounting field. This program responds to the demand within these field for sustainability literacy and knowledge of the new tools that expand the assessment and management of financial assets to include natural capital, climate and biodiversity risks and the incorporation of social inclusion and equity in the day-to-day operations of businesses. The first intake was above target. The school expects to reach steady state enrollment (80) in the next few years.

## **Professional Graduate Programs**

### **Master of Development Practice Program**

The Master of Development Practice (MDP), a 16-month professional course-based program, is part of the Global Association of MDP Programs that currently has 35 programs in 25 countries. Experiential learning and field placements are an integral component of the MDP program with an ever-growing network of

partners available at grass-roots organizations to international institutions. Since 2013, more than 100 MDP students have been placed with partner organizations overseas. As a member of the Global MDP Association, students enrolled in the University of Waterloo MDP program have had the chance to participate in discussions with experts on the future of sustainable development. The MDP cohort for the 2023 year has secured placements with a diverse set of organizations in Canada and abroad. The program has returned to an in-person format, with the opportunity to deliver field trips and access to field courses like Prateep Nayak's field course held in Chilika, India.

### **Master of Environment and Business Program**

The MEB program continues to offer a high-quality online professional course-based master's degree that can be completed part-time in two-three years or full-time in one year. With sustainability fully integrated into all courses, the program empowers current professionals to integrate sustainability into their own organization to take advantage of strategic opportunities in the space, or to apply business tools and strategies to advance sustainability across broader community contexts. The online MEB program has high flexibility, smaller class sizes and high instructor student ratios, and offers an accessible opportunity to advance the sustainability knowledge and careers of our students.

The MEB program continues to see an evolution in terms of the students coming into the program and what each hope to achieve from it. This year the program saw a shift from students with a financial management background, to students with a traditional business background, but also to many students with engineering, science, environment, and geography backgrounds. These shifts mirror the greater global concerns from the business community and the environmental field on the need to integrate these two areas and reinforce the significant role the program plays in facilitating the emergence of future leaders in the field of sustainability management.

### **Master of Development and Innovation**

MEDI is a three-term program with a strong focus on experiential learning and using the Kitchener-Waterloo region as a living laboratory to understand the innovation ecosystem and the underlying economic development processes that support it. As part of their course work, students often work with community partners to find solutions to economic development challenges faced by those partners. In Fall 2023, students visited the Working Centre, Lutherwood, Communitech, Velocity, and the City of Kitchener to learn about social innovation, brownfield redevelopment, strategic planning, and entrepreneurial ecosystems. We were also hosted by Community Futures Oxford on our annual rural innovation roadshow in Oxford County where students learned more about rural economic development in practice from county and municipal economic development teams and rural entrepreneurs. Faculty and students attended the annual Economic Developers Council of Ontario Conference in Toronto where we connected with many of our alumni at the Ec Dev at UW booth. Our students also have exciting capstone opportunities in Spring 2024 including internships with the municipal governments, the CSA Group, and the Commission for Environmental Cooperation.

## **Research Graduate Programs**

### **Master of Sustainability Management Program**

The master's in environmental studies in Sustainability Management continues to attract strong students that gain an applied research education while supporting the school's research. Student experiences have included research placements with municipalities and companies and provided opportunities for overseas and local field research. The program is supported with scholarships from the University of Waterloo's Water Institute, SSHRC (Social Sciences and Humanities Research Council) graduate awards, Mitacs, and with funds provided under professor research grants. Students in the program have published in the popular press, crafted policy papers, delivered conference papers, and some have authored in peer reviewed journals. Many graduates are continuing Ph.D. studies.

### **Ph.D. in Sustainability Management**

The school welcomed the sixth cohort of students to the new and innovative doctoral program (established in 2018). There remains robust interest in the program, which indicates the strong demand for a doctoral program in this newly emerging field, which trains students for the professional and academic markets in sustainability management.

### **Research Activities**

SEED faculty have continued to successfully attract research funding (~\$4.9 million in 2023) from major granting agencies, government agencies and private funders, including foundations, NGOs, and industry. SEED professors and students (often in teams) continue to publish in a variety of high impact outlets, both academic and professional outlets, as well as contributing to industry and other forms of knowledge dissemination.

### **Achievements and Impact**

While it is not possible to summarize all the outstanding impacts made by our students, staff, and faculty over the past year, below is a small selection of highlights as an indication of the local, national, and international reach of our School.

### **Students**

#### **Awards and Achievements**

- MEDI student Mithara Fonseka competed in the [2024 Systems Innovation Challenge](#), an opportunity for university students to come together to analyze problems affecting retailers. Fonseka and her teammates won Most Scalable Idea, an award that came with a \$5,000 prize. [Read the full story here.](#)
- OGS –Brady Reid, Kaylia Little, Leah Feor
- SSHRC – Donna Jones
- SSHRC Canada Graduate Scholarship – Foreign Study – Brady Reid
- R.S. Dorney Memorial Fellowship – Laura Blanco Murcia, Guneet Sandhu, Ruyel Miah
- Davis Memorial Scholarship – Navya Vikraman Nair
- George Mulamootil Graduate Scholarship – Navya Vikraman Nair

- David Johnson International Entrance Scholarship – Ana Lopez Franco
- Provost Doctoral Entrance Award for Women – Marianna Ottoni and Carolina Romero Pereira
- Caivan Future Cities Graduate Scholarship – Hope Isabu and Ayesha Rahaman
- David Johnston International Experience Awards- McCall MacBain – Navya Vikraman Nair, Ruyel Miah, Nilushika Gamage, Akash Kar
- RBC Graduate Scholarship – Leah Feor and Donna Jones
- Graduate Student Community/Industry Project Award – Navya Vikraman Nair
- CSFN Fellowship – Abolade Makinde
- GSEF Vice-coordinator Scholarship – Hope Isabu
- University of Waterloo Doctoral Thesis Completion Award – Monica Mic, Muhammed Adil Rauf, Basak Topcu, Matthew Judyn, Naomi Sunu, Saveena Patara, David Billedeau
- 3 students - Abigail Hamre, Sarah Harvey, Veta Parco - successfully completed an overseas placement in Uganda, Malawi, and Vietnam. This was the first cohort to complete in-person placements since COVID.
- SAID (Student Association of International Development) ran a successful networking event the evening of Tuesday, March 21, 2023. There were approximately 40 students, staff, and faculty in attendance. Two of the guest speakers were INDEV graduate – Jamie Sgro and Stefan Chan.
- SAID also ran a successful “Jeopardy” event on Wednesday, November 29<sup>th</sup>, 2023, pairing faculty, staff, and students in an evening of fun competition.
- HydroBud, founded by ENBUS students Jiayu Li, Alexis Windatt, Katie Franken, Laura Menezes, and Rumaisha Qadar during the inaugural interdisciplinary capstone experience. Their venture seeks to develop a self-sustained hydroponics system that grows fresh produce for foodbanks. Notably, the team's idea won of the Jack Rosen Award Pitch Competition (Mar 2024). This victory was followed by additional financial support received through the Winter 2024 Social Impact Showcase at United College, underscoring the potential and importance of their project.
- Ankesh Siddhantakar won best poster award at the Raw Materials for Sustainable Future Conference in February 2023. His poster titled “Helium resource sourcing and trade: Critical coproduct, cryogenic complexities” was based on research done under his supervisor Professor Steven Young and with colleagues at the University of Bordeaux and the University of Augsburg.
- Kaylia Little was selected to attend an international meeting of Arctic academics and practitioners in Washington, Dc where she attended a working meeting with 30 international academics and practitioners working in Arctic spaces. The purpose of the meeting was to bring together a diverse group of Arctic professionals to share current work, identify challenges to and opportunities for cross-border and cross-disciplinary collaborations. Attendees came from Canada, Sweden, Norway, Greenland, Iceland, and of course, the USA.
- Navya Vikraman Nair, PhD Candidate work was selected as one of this year’s top 25 Storytelling Challenge finalist, a national competition run by the Social Sciences and Humanities Research Council (SSHRC) for her video “Look beyond the beauty of our coastal wetlands, and you find this habitat is hard at work. “

#### **Staff**

- Our administrators – BIG THANKS for all your hard work!!

#### **Faculty**

- Cameron McCordic, Bruce Frayne, Prateep Nayak, Brend Doberstein (GEM) and Erin O’Connell (GEM) were awarded a SSHRC PDG \$198,835 to investigate the impact of cyclones on sustainable urban development in Beira, Mozambique, and Puri, India.
- Dr. Simron Singh (with SEED colleagues Dr. Michael Wood and Dr. Cameron McCordic) were

awarded a CAD\$ 1.2 M grant for the project RECOVER - Resilience to Climate Vulnerability and Environmental Risk – under the UK-Canada Climate Adaptation and Resilience (CLARE) research framework programme. RECOVER is a partnership with universities and key stakeholders in the small island developing states of Mauritius, Maldives, and Fiji. Together, they identify each island's exposure and risk to climate change and determine scalable strategies to address challenges that impede the availability of resources, materials, and critical services, such as food, water, energy, and health care.

- Dr. Simron Singh was awarded the University Research Chair (URC) in 2023 and received the Faculty Research Award 2023, both in recognition of the exceptional achievement in the area of socio-ecological metabolism and pioneering the field of island industrial ecology that analyses and leverages resource-use patterns in island systems as an adaptation strategy to climate change impacts.
- Komal and Steve's research work was picked up by local and national mainstream media outlooks for "Canadian e-waste has tripled; new study finds" and "What is carbon footprint of a hospital bed".
- Research by Dardir, Berardi, and Wilson, "Health-informed predictive regression for statistical-simulation decision-making in urban heat mitigation" has been awarded the Canada National Champion title for the Frontiers Planet Prize 2024. The lead author, Mohamed Dardir, is a postdoc with the University of Waterloo School of Environment Enterprise and Development. The authors are now competing for the international prize which will be announced June 26<sup>th</sup> in Switzerland. Nominee, Umberto Berardi, will be attending the ceremony. The research was carried out in collaboration with the Friends of the Greenbelt Foundation (Samantha Cava, Megan Sipos, and Shelley Petrie). Friends of the Greenbelt Foundation have been an amazing partner to work with. The project was also supported by Mitacs and the Canadian Research Data Centre Network (CRDCN).
- Neil Craik is leading a project evaluating the institutional governance practices of the International Seabed Authority – an international treaty organization that is responsible for overseeing deep seabed mining. The project is in partnership with Pew Charitable Trusts, and research partners in Australia, Germany, and the U.K, and is principally funded by SSHRC.
- Dr. Sean Geobey was named Social Capital Partners Fellow at the Rutgers Institute for the Study of Employee Ownership and Profit Sharing in 2023.
- Dr. Amelia Clarke published an article in a Financial Times top 50 (FT 50) management journal - *Journal of Management Studies* - on Cross-Sector Partnerships to Address Societal Grand Challenges: Systematizing Differences in Scholarly Analysis.
- Dr. Amelia Clarke landed a five-year Mitacs Accelerate cluster research grant worth \$466,667 that started in 2023. It is supporting graduate students working as part of the Municipal Net-Zero Action Research Partnership (N-ZAP).
- Congratulations to SEED's Dr. Cameron McCordic for receiving the Faculty Teaching award and Dr. Simron Singh for receiving the Faculty Research Award 2023 in the Faculty of Environment Award



## N-ZAP Team Presenting at Practitioner Conferences in 2023



### SUSM Graduate Student Thesis and Degree completions in 2023

- Support for the Task Force on Climate-Related Financial Disclosures (TCFD) and Impact on Non-Renewable Energy Sector Investments in United States Public Pension Funds  
Issett, Melanie (University of Waterloo, 2023-12-13)
- Understanding the Impact of COVID-19 on the Livelihood Resilience of Small-Scale Fisheries: A Comparative Analysis  
Abdelbaset, Maha (University of Waterloo, 2023-11-21)
- Nudging Toward Sustainability: A Pilot Study on Promoting Pro-Environmental Behavior and Reducing Carbon Emissions in a Net-Zero Carbon Building  
Yousuf, Mohamed (University of Waterloo, 2023-10-13)
- Exploring Technology Adoption in Canada's Mineral Mining Sector: Navigating Through an Interplay of Factors  
Crabbe, Mackenzie (University of Waterloo, 2023-10-05)
- Value Chain and Vulnerabilities in Small-Scale Fisheries Communities of Makoko, Lagos, Nigeria  
CHUKWUEMEKA, HAPPINESS (University of Waterloo, 2023-09-26)
- The Impacts of China's ETS on Firm Competitiveness; Evidence from the Power and Heat Production Sector  
Zhang, Mingming (University of Waterloo, 2023-09-25)
- Impacts of COVID-19 on Municipal Solid Waste Systems in Ontario, Canada: A Retrospective Reflection of Learnings from Municipalities  
Giesbrecht, Michelle (University of Waterloo, 2023-09-20)
- Sustainable Urban Development - a Nexus of Understanding, Methodology, and Governance  
Rauf, Muhammad Adil (University of Waterloo, 2023-09-19)
- Waste Diversion and Reduction in a Green Office Building: A Social Practice Theory Lens  
Moges, Haimanot (University of Waterloo, 2023-09-13)

- Governing Carbon Removal: Deploying Direct Air Capture Amidst Canada's Energy Transition  
Cortinovic, Stephanie Rose (University of Waterloo, 2023-09-08)
- A Big Tiny Problem: Flows of Primary Microplastics in Canada  
Sherlock, Cassandra (University of Waterloo, 2023-08-31)
- Analysis of Environmental and Social Performance of Sustainability-linked Bonds and Loans (SLBLs) in the Fashion Industry  
Sarker, Tanusri (University of Waterloo, 2023-08-18)
- Metallurgical Capacity: A Novel Metric for Quantifying Available Production of Mineral and Metal Products with a Case Study on Primary Non-Ferrous Nickel  
Faubert, Jamie (University of Waterloo, 2023-08-10)
- Knowledge On Tap: Measuring Sustainability Impacts of Ontario Craft Brewers  
Bosworth, Patrick (University of Waterloo, 2023-08-08)
- Is Revenue Sharing Real Reconciliation? Recognizing the role of Indigenous law and governance in British Columbia Crown forestry agreements  
Atleo, Tara (University of Waterloo, 2023-07-27)
- Pro-environmental behaviour impacts and their relationship to insurance claim frequency through individual household and municipal-level analyses  
Giesinger, Kayleanna (University of Waterloo, 2023-06-27)
- Greenhouse Gas Emissions cuts, a set of fuel-based mitigation wedges in Canada  
Hernández Enríquez, Aurora (University of Waterloo, 2023-05-24)
- Life Cycle Assessment of Medical Oxygen  
Tariq, Maliha (University of Waterloo, 2023-05-15)
- Assessing the Legitimacy of Sustainability Standard Programs in the Mining and Minerals Sector  
McGlade-Bouchard, Cameron (University of Waterloo, 2023-05-15)
- Addressing Human Dimensions within the criteria for conservation and sustainable use of Ramsar Wetlands  
Samiee-Zafarghandy, Mina (University of Waterloo, 2023-05-09)
- Social-ecological systems analysis of the dried fish value chain for community wellbeing in the Bay of Bengal coast of Odisha and West Bengal, India  
Pradhan, Sisir Kanta (University of Waterloo, 2023-04-28)
- Utilizing Indigenous Conservation in Canada to Strengthen Contributions to Environmental Targets and Reconciliation Goals  
Cox, Elaina (University of Waterloo, 2023-04-27)
- An analysis of Canadian young adults' eating behaviours towards sustainable food choices  
Mollaei, Sadaf (University of Waterloo, 2023-04-21)
- Unpacking the Intention-Behaviour Gap in Canadian Consumers' Food Purchasing Decisions  
Farley, Karen (University of Waterloo, 2023-04-21)
- Deep Decarbonization in Cities: Greenhouse Gas Emissions Measurement, Monitoring, and Reporting  
Neveroff, Collin (University of Waterloo, 2023-04-18)
- An Extensive Green Bond Market Analysis from 2015 to 2021  
Gokkaya, Onurcan (University of Waterloo, 2023-04-13)
- Understanding the Benefits of Community-Focused and Affordable Housing Projects from a 3-Pillar Perspective: An Impact Measurement Framework  
Brierley, Tatianna (University of Waterloo, 2023-04-03)
- Deep decarbonization pathways, strategies, governance, actors, and roadblocks in cities: Climate change mitigation perspectives from selected Sub-Saharan African Cities  
Akamolafe, Bayode (University of Waterloo, 2023-03-30)

- Impact Investing and Climate Change – An Assessment of Impact Investors Addressing Climate Change  
Ahmed, Muhammad (University of Waterloo, 2023-03-17)
- Understanding food consumption behaviors; Prospects for shifting towards sustainable diets  
Bahari, Kimiya (University of Waterloo, 2023-02-14)
- Sustainable or same-old? An Investigation into the Communication of Green Features within Online Real Estate Listings across Five Southern Ontario Municipalities  
Vanderbeek, Bailey (University of Waterloo, 2023-02-10)
- Towards Effective Watershed Governance: A Case Study of the Grand River Basin  
Timberg, Laina (University of Waterloo, 2023-01-26)
- Characterizing Net Life Cycle Greenhouse Gas Emissions and Environmental Performance of Organic Field Crops in Ontario and Quebec  
Madhanaroopan, Shenali (University of Waterloo, 2023-01-20)
- Islands at Risk - Analyzing Resource-use Dynamics from a Socio-metabolic Research Perspective  
Felix Martin del Campo, Francisco Xavier (University of Waterloo, 2023-01-19)
- A net-positive energy building assessment: commissioning and COVID-19 insights  
Mikhail, Monika (University of Waterloo, 2023-01-09)

Prof. Neil Craik, Director