

Report to Bureau April 2020
Chemical Research Applied to World Needs (ChemRAWN) Committee
Francesca Kerton Chair
6 April 2020

I. Executive Summary:

The work of the ChemRAWN committee brings chemistry into action in civil society in a way that benefits people and their quality of life. The most urgent needs are in countries in transition, but the perspective is really global. The topics that ChemRAWN focuses on are all subjects that relate closely to the UN Sustainable Development Goals and as such the committee serves the vision of IUPAC as part of ‘an indispensable worldwide resource for chemistry’. All Committee activities are therefore aimed at fulfilling IUPAC’s mission and strategic plan through the committee’s goals in pursuit of the application of chemistry in the service of humankind and the world. We are currently diversifying our means of achieving these goals, not only in our established one-of-a-kind multidisciplinary conferences with associated outcomes and the work of the future outcomes committee for our conferences, but with outreach, workshop and symposia to raise the profile of IUPAC with stakeholders. It should be noted that ChemRAWN conferences and activities not only involve chemists but policy makers, engineers, non-governmental organizations with interests in how world needs can be met. We are happy to play our role in IUPAC’s next centenary, as challenges and opportunities for chemists and chemistry evolve.¹

ChemRAWN priorities for 2020-21 include:

- Development of relationships to work collaboratively with committees/groups/divisions both inside and outside of IUPAC.
 - For example, work with IUPAC Chemistry Education, and Chemistry and Industry committees on initiatives (future projects) related to capacity building through chemistry research and training, and entrepreneurship training related to chemical technologies.
- Raising awareness, social responsibility, and understanding of how chemistry and related disciplines can be used to address unmet world needs in areas including sustainable development, health and equality.
 - Social media, webinars and other non-conference outlets will be used to support these goals.
- Successful coordination and completion of ChemRAWN XXII E-Waste Africa Conference in Lagos, Nigeria (May 2021), and planning of future ChemRAWN XXIII Conference on Medical Supply Chain Security.
- Reinvigorate our committee (established in 1973) through frequent bimonthly virtual meetings, improved engagement/involvement of current committee members and recruitment of additional National Representatives.

The Committee continues collaborating with the Interdivisional Committee on Green Chemistry for Sustainable Development (ICGCSD) and supporting the administration of the biennial process for the CHEMRAWN VII Prize on Environmental & Green Chemistry. The 2018 Prize was awarded to Dr. Mirabbos Hojamberdiev a Senior Researcher of Turin Polytechnic University in Tashkent, Uzbekistan. He obtained this recognition at the 8th IUPAC Conference on Green Chemistry that was held in Bangkok, Thailand on 9 – 14 September 2018. The call for

¹ *Not an Epilogue, but a Commencement*, B. Van Tiggelen, *Chemistry International*, **2019**, 41 (3), p. 58

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nominations for the 2020 competition is now open and being promoted by our committee members and those of ICGCSD.

Activities in 2018/19 are detailed in section IV of this report and have included a ChemRAWN committee mini symposium on Green Catalysis during the 2019 Asian Chemical Congress in Taipei, IUPAC and ChemRAWN involvement at the 2nd International Conference on Neglected Tropical Diseases, an Entrepreneurship Training Program facilitated by the Aalto Venture Program, Outreach at the 33rd Latin American Congress (2018), University of West Indies (2019) and others.

II. Plans and priorities for this biennium, and beyond:

Our planned activities are fundamentally aligned with the IUPAC's objectives and include:

- Highlighting and addressing global needs that could benefit from matured concepts arising from applied chemistry research and associated chemical technologies.
- Promoting communication among chemists, organizations and stakeholders in civil society with special emphasis on bringing them together to achieve practical solutions for world needs, which from a global perspective are often issues for developing countries. As part of this conversation, other disciplines are involved in these discussions with a view to promoting a better understanding and to work toward realistic solutions.
- Leveraging IUPAC's resources platform through improved interdivisional interaction and collaboration.
- Supporting multidisciplinary initiatives/projects that can evolve towards addressing critical global issues and the development of related conferences (in this *biennium E-waste* and potentially *Secure Medical Supply Chains*). Where appropriate, beyond conferences, we will carry on the conversation by making use of virtual technologies, social media platforms and other newer/emerging means to achieve these goals
- Repositioning the chemical sciences towards enhancing research for capacity building via the application of chemistry globally, especially in developing countries, towards solving their needs.
- Increasing the diversity and a broader member base for our committee and IUPAC as a whole.
- Promoting entrepreneurship and innovation via chemistry for socio-economic development.

Our committee has many plans in place for the Montreal World Chemistry Congress in 2021, proposals for a workshop on entrepreneurship and another on social media have been accepted, and we are also organizing a symposium "Building bridges – partnerships in science to address health, environmental protection and peace". Furthermore, Dr. Zafra Lerman (TM of our committee) has been invited as a Plenary Speaker to the congress. On this note, our committee is eager to work with Lerman and organizers of the Malta conference series to raise the profile of IUPAC and ChemRAWN with their attendees from Middle Eastern Countries. The committee aims to look into methods of support and alternative fundraising strategies. We will especially focus on raising funds to sponsor the next generation of scientists to attend such meetings.

ChemRAWN XXII Conference, E-Waste Africa, is at an advanced stage in its organization and will be held in Lagos, Nigeria (5-7 May 2021). Members of ChemRAWN (Leiv Sydnes, AM, and Jay Oghifo, TM), the Local Organizing Committee and the International Advisory Board have been working hard during the past year. They have been working with IUPAC NAOs and

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regional chemical bodies in Africa, and collaborating with Division VI (Chemistry and the Environment) via Nadia Kandile (AM, ChemRAWN, Egypt). The latest news on this conference is shared on our social media sites. We hope that this conference held in Africa can be further developed and implemented. Particularly, there is interest from our colleagues in Asia about exploring the possibility to hold a similar conference at a later date because E-waste is considered a critical problem in South-East Asia too. One idea moving forward is for successful ChemRAWN conferences to be replicated in different regions around the world. Similarly, there is interest in replicating the conference on Herbal Medicines (ChemRAWN XX) in the Latin American region.

We are preparing a vision statement and value proposition to share with the IUPAC Committee on Chemistry Education towards a conference on Chemical Research for Capacity Building to be held in Nepal (Rameshwar Adhikari, NR and Zafra Lerman, TM). In relation to the repositioning of chemical research for capacity building aimed at solving their needs, we have already carried out some preliminary work in Nepal related to workshops that support the concept in that country and in emerging regions in South Asia in general. It has been our plan to expand on this initiative, as a longer-term goal, by developing a generic program (a train the trainer approach) that allows the workshop model to be replicated in other Low-Income Countries. We are also working on initiatives related to science entrepreneurship, e.g. workshops at international conferences such as Montreal WCC 2021, and if ‘lean’ start-up models are used, this might be another model to promote research capacity building in emerging regions. An ultimate goal is to consider organizing an international conference on science entrepreneurship in collaboration with COCI. In keeping with the ChemRAWN goals, this initiative is to be especially directed toward the needs of chemists in low-income countries. We have come to realize that there are inherent challenges in organizing our conferences (leveraging funding) in locations where they are most needed. This may require some imaginative and non-traditional fundraising activities as we move forward such as crowdfunding.

There will be a ChemRAWN/IUPAC symposium at the *12th International Multidisciplinary Conference on Drug Science* (Warsaw 18-20.11.2020) organized by Oleg Demchuk (Secretary, ChemRAWN). This will act as a pre-conference and allow planning for a ‘*Medical Supply Chain Security*’ ChemRAWN conference – this is particularly timely given the current Covid-19 pandemic and anticipated future disease outbreaks of a similar nature. The scope of the conference will not only cover drug security but also medical devices and PPE access. We will be reaching out to Division VII (Chemistry & Health) and COCI as we progress in the organization of this conference.

Another timely topic for a future ChemRAWN conference that we are at the very early stages of considering is ‘Plastics and the Environment’, we encourage other IUPAC committees and divisions to contact us if they are interested in being involved.

It should be noted that in the past, most ChemRAWN initiatives do not qualify for support through the project system but as we diversify our efforts – we intend to work with other committees and IUPAC volunteers to develop project proposals of relevance to our committee’s goals. Francesca

Kerton (Chair) and Ekaterina Lokteva (TM) are members of the task group for the recently approved IUPAC project “*Creation of IUPAC Global Women’s Breakfast Series and a Global Network in Support of Eliminating the Gender Gap in the Chemical Sciences*”, which addresses diversity in the worldwide chemistry community.

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In terms of communication, we continue to develop our social media presence and strategies. Members of our committee are working to prepare infographics to share on Twitter (@Chemrawn) and Facebook (<https://www.facebook.com/ChemRAWN/>) to communicate the outcomes of previous ChemRAWN conferences and our plans for the future with as broad a group of stakeholders as possible. We are preparing a value proposition to work with experts (such as ACS International Center) to provide Webinars on ChemRAWN's work and other topics of interest to a general audience. We are also working to continue to capitalize and leverage the ChemRAWN Ambassador's initiative to encourage our members to look for occasions to offer presentations in international, national and regional conferences on relevant themes.

During the past quarter, we have met virtually three times since December 2019, and we intend to continue this intensive spell of virtual meeting to reinvigorate our committee (i.e. bimonthly meetings). We are also making use of google docs to share and develop ideas across our committee and a virtual noticeboard, Kudo board (thank you to F. Meyers for this idea), to highlight our ongoing tasks within the committee and to facilitate communication outside of our regular meetings.

III. An overall report of Division/Committee activities and achievements during the 2018-2019 biennium *organized by the Goals and Objectives laid out in the current IUPAC Strategic Plan.*

Due to precarious position that the ChemRAWN committee was placed in during the past biennium, as it faced dissolution at the Paris General Assembly, it was challenging to achieve significant progress and engagement towards our committee's and IUPAC's goals. The main priorities targeted for the 2018-2019 biennium aimed to address functional, operational aspects of the committee, programmatic initiatives and project workload, and communication with the executive committee of IUPAC. We have developed a work plan that is less dependent on conferences and have been developing alternate activities through which similar objectives can be attained in between the high impact conferences. These high impact conferences, where we are trying to hold them in lower income countries, are more challenging to organize due to funding constraints. Under the circumstances, plans for the organization of activities from projects and initiatives programmed during the past biennium (2018-19) were slowed down or put on hold.

We have been and will be addressing IUPAC's Goals in a number of ways and especially:

- (i) *Provide scientific expertise to address critical world needs.* Our committee, as its name states, targets the use of chemical research to meet unmet world needs. For example, we continuing to organize, with the local organizing committee, the ChemRAWN XXII conference "E-waste Africa", which will be held in Lagos, Nigeria in May 2021. We are also communicating and sharing news from the broader chemistry community on our social media platforms and seeking input from stakeholders concerning world needs that could be addressed through chemistry e.g. security of medical supplies.
- (ii) *Improve the vitality, effectiveness and efficiency of our Union.* We are working with chemists in emerging economic regions that are typically under-represented in the Union. Engaging with chemists truly representing the whole world in which we live will improve the vitality of the Union. Furthermore, we are investigating newer

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avenues of communication and outreach (e.g. webinars, social media) to increase efficiency within our committee and our interactions with others.

We have been addressing IUPAC's Objectives in a number of ways:

“Brand IUPAC in the minds of stakeholders” – through our IUPAC ChemRAWN ambassadors' program we have given seminars on what IUPAC is and highlighted the work of the ChemRAWN committee over the years, and sponsored symposia and workshops. This included a talk at the 33rd Latin American Chemistry Congress (Habana, Cuba, 2018), a Green Catalysis one-day ChemRAWN committee mini-symposium at the 2019 18th Asian Chemical Congress (Taipai, Taiwan, 2019), 5th International Scientific School-Conference for Young Scientists “Catalysis: from Science to Industry” (Tomsk, Russia, 2018), and XI International conference “The mechanisms of catalytic reactions” (Sochi, Russia, 2019).

“Improve quality and frequency of communication with stakeholders” – since the Sao Paolo General Assembly, we have established social media accounts (e.g. twitter and Facebook) and are continuing to work on such platforms and increase training opportunities for other chemists under the IUPAC ChemRAWN banner. For example, Dr. Raychelle Burks and past-chair Dr. Carlos Tollinche organized and hosted a social media workshop at the Fall ACS meeting 2018 (Boston, August 19-23).

“Expand and retain Member and volunteer base with an emphasis on diversity and inclusion” – through our ChemRAWN ambassador's program mentioned above, talks on IUPAC have been given at events for the Global Women's Breakfast in 2019, and around the world (including Caribbean Countries and Egypt).

“Enhance interdivisional interaction and collaboration” – We participated in IYCN events such as the ‘speed-dating’ event at the Paris 2019 World Chemistry Congress. This included the preparation of a booklet and poster highlighting previous and planned works of the ChemRAWN committee. This was also an opportunity to meet with and talk with members of other IUPAC divisions and committees. We would like to develop projects with other committees and divisions during the forthcoming biennium and have already been working with Division VI for the ChemRAWN XXII conference E-Waste Africa. Two ChemRAWN committee members are part of the task group for the project ‘Creation of IUPAC Global Women's Breakfast Series and a Global Network in Support of Eliminating the Gender Gap in the Chemical Sciences’ so will be working with a team of other IUPAC volunteers representing a range of disciplines.

“Emphasize multidisciplinary projects addressing critical global issues” – As outlined above, a key outcome of the past biennium has been the organization of ChemRAWN XXII Conference on E-Waste. Division VI has been involved in this initiative and we aim to work with Division VII on a future ChemRAWN conference on Medical Supply Chain Security. We will start to develop projects with other committees and divisions during the current biennium.

“Support chemistry education, particularly in developing countries” – An important aspect of our forthcoming ChemRAWN XXII E-waste Africa conference will be the development of teaching materials and specifically to communicate with the public regarding remediation of E-waste and pollution that can occur if electronic materials are not disposed of appropriately. We continue to work with chemists in Nepal on Capacity Building for Chemistry Research and we will be communicating with Chemistry Education to collaborate on future initiatives.

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IV. Tabular material.

Conferences, symposia and outreach activities for 2018/19 biennium

- Co-sponsored with Puerto Rico NAO and IUPAC Division VII (Chemistry and Human Health) *the 2nd International Conference on Neglected Tropical Diseases* (June 25-27, 2018) – Received endorsement from IUPAC and granted sponsorship for 3 scientists from emerging countries through the program of Financial Support for Conferences (FSC #2018-003-1) in Scientifically Emerging Regions (SER). There were 80 participants from 10 countries, 8 plenary speakers, with a PAHO speaker the regional representative of WHO, 28 presentations and 25 posters.
- A presentation about ChemRAWN was given (Carlos Tollinche, NR) at the 33rd Latin American Chemistry Congress held in Habana, Cuba 9-12 October 2018.
- As part of GWB activities in the IUPAC centenary year, February 2019, Kerton gave the short promotional talk “*How to Guide: Women in IUPAC and Opportunities for You*” in Atlantic Canada (she connected virtually with four Universities across the region).
- “*Introduction to the International Union of Pure and Applied Chemistry*”, a keynote lecture by Prof. Nadia Kandile (AM) was given at the conference of the Egyptian Committee of Pure and Applied Chemistry 20-22 Oct 2019, Hurghada, Egypt
- “*Introduction to the International Union of Pure and Applied Chemistry*”, departmental seminar, and “*Introduction to Green Chemistry and Opportunities for International Collaborations*”, workshop, were give by Francesca Kerton (Chair, ChemRAWN) at the University of West Indies-St. Augustine, Nov 2019
- *Green Catalysis* one-day ChemRAWN committee mini-symposium at the 2019 18th Asian Chemical Congress, Taipai, Dec 12, 2019 [organized by Prof. Brindaban Ranu (AM) with industrial support leveraged by Hidehiko Yashima (TM)]. This involved opening remarks where the function and objectives of the ChemRAWN committee under the umbrella of IUPAC were explained to the audience. Outcomes included suggestions for future impactful research including bio- and photo-catalysis, ball-milling (solvent free) processes and economically viable, recyclable catalyst systems for industrial applications.
- Oral presentations of IUPAC/ChemRAWN activities were performed by Prof. E.Lokteva on 5th International Scientific School-Conference for Young Scientists “*Catalysis: from Science to Industry*” (Tomsk, Russia, 2018), and on XI International conference “*The Mechanisms of Catalytic Reactions*” (Sochi, Russia, 2019). The presentation of this type International Union of Pure and Applied Chemistry (IUPAC) – the organization, advancing the worldwide role of chemistry was planned for March 2020 on the IUPAC conference “*Snow Cover, Atmospheric Precipitation, Aerosols: Chemistry and Climate*” to be held on Baikal Lake, Russia, but due to COVID pandemic it is postponed to September 2020.

Publications

- Leiv, K. Sydnes, “Health for All in Dhaka: CHEMRAWN helps establish an International Centre for Natural Product Research”, *Chemistry International* 2018, 40 (4) p. 17
- Mirabbos Hojamberdiev is awarded the 2018 IUPAC ChemRAWN VII Prize for Green Chemistry, *Chemistry International* 2018, 40 (4), p. 22.

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Membership ChemRAWN 2020-21

Name	Status	NAO
Francesca Kerton	STC-Chair	Canada
Oleg Demchuk	STC-Secretary	Poland
Zafra Lerman	TM	Israel/USA
Venceslav Kaucic	TM	Slovenia
Ekaterina Lokteva	TM	Russia
Jay Oghifo	TM	Nigeria
Hidehiko Yashima	TM	Japan
Raychelle Burks	TM	USA
Leiv Sydnes	AM	Norway
Brindaban Ranu	AM	India
Nadia Kandile	AM	Egypt
Lin Zhuang	AM	China
Joon C. Juan	AM	Malaysia
Venko Beschkov	AM	Bulgaria
<i>Open Position</i>	<i>AM</i>	-
Ting-Kueh Soon	NR	Malaysia
Ramanee Wijesekera	NR	Sri Lanka
Guillaume Journot	NR	France
Carlos A. Tollinche	NR	Puerto Rico
Rameshwar Adhikari	NR	Nepal
<i>Open Positions</i>	<i>5 NRs</i>	-

A final remark about ChemRAWN:

The Committee was founded in 1973 and has a unique mandate within the Union. We work to highlight and publicize the role of applied chemistry, and thus act as an outreach arm of the Union in solving problems of global significance. All of our initiatives, projects and conferences have been oriented towards problem solving of issues many times for particular regions and developing countries. In these efforts, ChemRAWN brings together a broad range of scientists and experts, from different disciplines, along with members of business, government and other stakeholders of the civil society in the discussion towards better understanding of the problems while aiming at realistic solutions. Due to recent plans to dissolve the committee that did not come to fruition, we are now in a period of reinvigoration and looking to work with other committees/divisions/organizations to help solve world needs through the application of chemistry.