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**PROGRESS MADE AND REVIEW OF THE STATUS OF THE IMPLEMENTATION
OF ARTICLE XI OF THE CHEMICAL WEAPONS CONVENTION**



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EXECUTIVE SUMMARY

1. This report has been produced for the Ninety-Eighth Session of the Executive Council (hereinafter “the Council”) in response to a decision by the Conference of the States Parties (hereinafter “the Conference”) at its Sixteenth Session (C-16/DEC.10, dated 1 December 2011) entitled “Components of an Agreed Framework for the Full Implementation of Article XI”, in which the Conference requested the Technical Secretariat (hereinafter “the Secretariat”) to provide annual reports to the Council and the Conference on the progress of concrete measures undertaken in implementing the decision, and on the status of implementation of Article XI of the Chemical Weapons Convention (hereinafter “the Convention”). The reporting period for this report is 26 August 2020 to 25 August 2021.
2. During the reporting period, the Secretariat further enhanced its delivery of programmes and activities aimed at implementing Article XI and addressing the four areas identified by decision C-16/DEC.10. The Secretariat continued to deliver established programmes surrounding the three focus areas of integrated chemicals management, enhancement of laboratory capabilities, and chemical knowledge promotion and exchange.
3. All programmes and initiatives continued to be implemented using a results-based approach, paying special attention to cost-effectiveness, and took into account the needs and priorities of the States Parties. The resources used were provided from the regular budget, as well as voluntary contributions, both financial and in-kind, received for specific activities from several States Parties and entities.
4. The COVID-19 pandemic has had an impact on the implementation of all three thematic areas of Article XI. In an effort to accommodate the needs of States Parties and to minimise to the extent possible the impact of this situation on the implementation of the Article XI programmes, various activities were offered through online modalities. This is in line with Secretariat Notes S/1930/2021 (dated 18 February 2021) and S/1967/2021 (dated 5 July 2021), issued during the period under review.
5. During the reporting period, the Secretariat organised 21 online capacity-building programmes (training activities, seminars, and workshops) with a total of 908 participants from 115 States Parties. The Secretariat supported 23 research projects, one fellowship, and three conferences, of which two were held online and one was conducted in hybrid format.
6. In the area of integrated chemicals management, during the reporting period the Secretariat completed two online courses under the Associate Programme, benefitting 63 participants from 49 States Parties. Because of the COVID-19 outbreak, the in-person training for the twenty-first and twenty-second editions of the Associate Programme has been recalibrated and rescheduled to take place at OPCW Headquarters from 18 October to 5 November 2021. Forty selected candidates will be invited to attend this in-person training.
7. A special focus continued to be placed on chemical safety and security management, with the organisation of 10 training courses and workshops benefitting 489 participants from 91 States Parties.

8. In other activities under the integrated chemicals management group of programmes, including the Responsible Care[®] workshops, the Secretariat supported 20 participants from seven States Parties.
9. In the area of enhancement of laboratory capabilities, the Secretariat delivered five laboratory training courses, benefitting 54 participants from 14 States Parties.
10. Under the chemical knowledge promotion and exchange group of programmes, various opportunities were provided to further enhance networking and the exchange of information and knowledge among scientific communities, academic institutions, chemical industry associations, and non-governmental organisations (NGOs), as well as regional and international institutions. The Secretariat sponsored three scientific conferences (two online and one hybrid) in three States Parties under the Conference Support Programme, benefitting 214 experts; directly funded 23 research projects in 14 States Parties; co-funded, in collaboration with the International Foundation for Science (IFS), 13 research projects in 10 States Parties under the Programme for Support of Research Projects; and provided one fellowship for junior scientists under the Fellowship Programme.
11. To enhance the effectiveness and impact of the international cooperation programmes provided by the Secretariat to States Parties under Article XI, a cost-effective and results-based approach was implemented. Special attention was given to the alumni networks of the programmes. In addition to the vibrant alumni network of the Associate Programme, similar networks have been established for the Chemical Safety and Security Management Programme, the Integrated Chemicals Management Programme, and the Women in Chemistry initiative. The alumni networks offer the Secretariat an additional channel to communicate with former participants and make it possible to follow and support their initiatives to disseminate the knowledge and experience gained during various programmes, including in regard to education and outreach on the Convention and on peaceful uses of chemistry.
12. Furthermore, the importance of enhancing capacity-building needs assessments was underlined for the delivery of pertinent and effective programmes. In this context, during the reporting period the Secretariat continued to conduct a needs assessment in the area of integrated chemicals management. The Secretariat also invited the States Parties, on a voluntary basis, to submit assessments on their specific needs in chemical safety and security management, as well as information on existing tools, guidance, and best practices in chemicals management in their respective countries.
13. The evaluation and impact assessment approach and techniques were substantially institutionalised during the reporting period. The assessment of all programmes was based on structured feedback from the various stakeholders, including participants, relevant institutions, and National Authorities of States Parties, and also on regular follow-up of participants' career paths and academic development vis-à-vis the impact of the respective programmes in which they participated. During the reporting period, the Secretariat carried out a comprehensive survey on the Women in Chemistry initiative, covering the last four years (2016 to 2019).

14. As part of the Secretariat's continued efforts to facilitate States Parties' participation in the fullest possible exchange of chemicals, equipment, and scientific and technical information relating to the development and application of chemistry, the Secretariat continued to support the deliberations of States Parties through the informal consultations mechanism. Also, the Secretariat undertook substantial efforts to reach out to States Parties that seldom participate in the Secretariat's international cooperation programmes to encourage them to take part in and benefit from them. The Secretariat also adopted a more proactive approach to encouraging relevant States Parties to make donations for the Equipment Exchange Programme.

INTRODUCTION

15. The Conference at its Sixteenth Session adopted a decision regarding the components of an agreed framework for the full implementation of Article XI of the Convention (C-16/DEC.10), and requested the Secretariat to report to the Conference at each regular session on the progress of concrete measures undertaken in implementing the decision, and on the status of implementation of Article XI. This report is submitted in accordance with the Conference request, with the reporting period being from 26 August 2020 to 25 August 2021.
16. The components included in the agreed framework identified concrete measures in the following areas:
 - (a) national capacity building for the research, development, storage, production, and safe use of chemicals for purposes not prohibited under the Convention;
 - (b) promoting networking and exchange among scientific communities, academic institutions, chemical industry associations, NGOs, and regional and international institutions;
 - (c) enhancing the effectiveness of current international cooperation programmes of the OPCW; and
 - (d) measures by States Parties and the OPCW to facilitate States Parties' participation in the fullest possible exchange of chemicals, equipment, and scientific and technical information relating to the development and application of chemistry, in accordance with the provisions of the Convention.

ACTIVITIES UNDER CONFERENCE DECISION C-16/DEC.10 ON THE FULL IMPLEMENTATION OF ARTICLE XI OF THE CONVENTION

17. During the reporting period, the OPCW continued the implementation of Article XI of the Convention through various programmes and activities that were identified in decision C-16/DEC.10. The programmes continued to be implemented taking into account the needs and priorities of the States Parties, with resources provided from the regular budget as well as voluntary contributions, both financial and in-kind.
18. In accordance with the results-based approach that the Secretariat continued to apply during the reporting period, the effectiveness of these programmes was assessed according to whether skills and capabilities were enhanced in the three focal areas relating to the peaceful application of chemistry: integrated chemicals management,

enhancement of laboratory capabilities, and chemical knowledge promotion and exchange.

19. The assessment of all programmes was based on feedback from the participants and from States Parties, as well as on observation of the evolution of the participants' career paths or academic development following their participation in the various programmes.

NATIONAL CAPACITY BUILDING FOR THE RESEARCH, DEVELOPMENT, STORAGE, PRODUCTION, AND SAFE USE OF CHEMICALS FOR PURPOSES NOT PROHIBITED UNDER THE CONVENTION

20. National capacity building for the research, development, storage, production, and safe use of chemicals for purposes not prohibited under the Convention has been supported through a number of programmes, including but not limited to the Associate Programme, the Laboratory Twinning and Assistance Programme, analytical skills development courses, training courses for the OPCW proficiency tests, and the Chemical Safety and Security Management Programme.
21. The portfolio of international cooperation programmes under Article XI features the following:
 - (a) Integrated chemicals management:
 - (i) Associate Programme;
 - (ii) chemical safety and security management;
 - (iii) green and sustainable chemistry;
 - (iv) Responsible Care® workshops;
 - (v) forum on the peaceful uses of chemistry;
 - (vi) annual courses on loss prevention and safety promotion in chemical process industries; and
 - (vii) development of tools and guidance on chemical safety and security management;
 - (b) Enhancement of laboratory capabilities:
 - (i) analytical skills development courses/proficiency testing training;
 - (ii) customs laboratory training;
 - (iii) Laboratory Twinning and Assistance Programme; and
 - (iv) Equipment Exchange Programme; and
 - (c) Chemical knowledge promotion and exchange:
 - (i) Fellowship Programme;
 - (ii) Programme for Support of Research Projects;
 - (iii) Conference Support Programme;
 - (iv) empowering women in chemistry; and
 - (v) policy and diplomacy for scientists.

INTEGRATED CHEMICALS MANAGEMENT

22. The integrated chemicals management concept is based on the holistic approach of looking at a variety of aspects, including policy, practices, science, and engineering, to address various facets of chemicals management from a health, safety, and security standpoint, towards the ultimate goal of ensuring the safe and secure management of chemicals throughout their life cycle.

Associate Programme

23. The Associate Programme aims to address the objectives set out in Article XI of the Convention in terms of capacity building and implementation of the Convention in areas relating to chemistry for peaceful purposes—in particular in developing countries and countries with economies in transition.
24. The programme facilitates capacity building in States Parties by imparting requisite skills to qualified chemists and chemical engineers and by exposing them to the modern chemical practices required to operate effectively and safely in a modern chemical industry environment. Moreover, it enhances the ability of States Parties to implement the industry-related provisions of the Convention and broadens the talent pool of those assuming the responsibility for implementation within the National Authorities and other relevant institutions. The programme also facilitates the trade in chemicals by disseminating the best practices in this field.
25. The Associate Programme also supports the Responsible Care® initiative. Additional modules to promote chemical safety and security have been added to the training programme to enhance knowledge about modern practices relating to chemical safety and security, while at the same time generating greater awareness about the peaceful uses of chemistry.
26. The twenty-first edition of the Associate Programme was scheduled to commence on 24 July 2020 and conclude on 25 September 2020. Amid the COVID-19 pandemic, and to ensure the safety of the participants throughout the programme, the twenty-first edition of the Associate Programme was recalibrated and rescheduled. Thirty-six participants were provided with online training from 21 September to 1 October 2020. During the two-week online course, participants learned about various safety and security aspects of the operational environment in chemical plants, acquired a range of chemical engineering and industrial management skills, and studied the verification regime under the Convention. There were also live sessions that were made up of eight interactive training modules, video lectures, assignments, quizzes, and assessments. Through these modules, trainees interacted with Associate Programme alumni and experts who developed the course. The programme also served as a discussion platform to allow for more in-depth discussions of the course topics, as well as further networking opportunities. The 36 participants were from the following 34 OPCW Member States: Argentina, Armenia, Bangladesh, Barbados, Belarus, Botswana, Brazil, Cameroon, China, Costa Rica, Cuba, the Democratic Republic of the Congo, the Gambia, Ghana, India, Jamaica, Kenya, Malawi, Mauritius, Namibia, the Niger, Nigeria, Pakistan, Panama, Qatar, Sierra Leone, Somalia, Sri Lanka, Uganda, Ukraine, the United Republic of Tanzania, Uzbekistan, Viet Nam, and Zambia. In-person training under the programme will follow later in 2021.

27. The twenty-second edition of the Associate Programme was scheduled to take place from 30 July to 1 October 2021 and was also recalibrated and rescheduled due to the continuing COVID-19 pandemic situation. Twenty-seven participants who were selected from the interviews participated in an intersessional online training course from 18 May to 1 June 2021. The course focused on process safety and security in the operational environment of a chemical plant and on best practice in the chemical industry. The course also assisted in building diverse skills in chemical engineering and industrial management, including chemical industrial processes and chemical plant security management. The online training session was attended by participants from the following 18 Member States: Afghanistan, Bahrain, Cambodia, Cameroon, Chile, Colombia, Ethiopia, Iran (Islamic Republic of), Iraq, Mozambique, Nicaragua, Nigeria, the Philippines, the State of Palestine, the Sudan, Uganda, the United Republic of Tanzania, and Zimbabwe. Fourteen of the participants will be qualified to participate in the in-person training under the programme later in 2021, joined by the carried-over pool of participants from 2020.
28. While closely monitoring the evolving situation of the COVID-19 pandemic, the Secretariat is endeavouring to organise a three-week in-person training course under the Associate Programme at OPCW Headquarters from 18 October to 5 November 2021. Forty candidates selected for the 2020 and 2021 editions of the programme will be invited to attend this in-person training.
29. To date, 21 editions of the Associate Programme have taken place, with the 545 professionals from 121 States Parties who have successfully participated now being engaged in an active alumni network. The Associate Programme has established itself as the flagship programme of the OPCW in the area of international cooperation.
30. The programme has been subject to regular reviews and has been expanded in duration, number of participants, and training modalities. Each year, the Associate Programme targets young professional scientists and engineers, with a specific focus on Member States with economies that are either developing or in transition. Special attention is also given to the participation of female professionals, with 160 women from 77 States Parties enrolled in the programme thus far. Feedback received from the participants has indicated their great appreciation of the training, which has considerably upgraded their knowledge, technical skills, and experience in terms of chemistry and chemical and process engineering, with a focus on chemical safety management. Additionally, the training has increased participants' knowledge of the Convention and of the mission and role of the OPCW. Following the completion of the programme, participants serve as resource persons to their National Authorities and offer valuable support regarding the implementation of the Convention at the national and regional levels. It is noteworthy that, over the years, several former participants in the programme have later become Secretariat staff members.
31. The Alumni Association of the Associate Programme, established in 2012 and using a Facebook group page, continued to provide a highly interactive forum in the reporting period, bringing together previous participants and allowing for the sharing of views, scientific information, and experiences in the field of chemistry. In addition, the association continued to constitute a reliable channel to receive feedback from members regarding the programme, so as to ensure its continuous upgrade and to assess its impact over the years. The group also offers the opportunity of professional networking, as

participants can get together for joint projects and help each other with other professional opportunities.

Chemical safety and security management, including needs assessment and forum on the peaceful uses of chemistry

32. The chemical safety and security management related activities that took place during the review period were also generously supported through voluntary contributions from the European Union and the Governments of Germany, Qatar, and the United States of America. Global, regional, and national events were planned to meet the needs of the participating countries. This has given impetus to the promotion of chemical safety and security in participating States Parties, especially in terms of sharing experiences and best practices.¹
33. During the reporting period, the Secretariat organised 10 online capacity-building activities on chemical safety and security management.
34. The Secretariat organised an online advanced course on chemical safety and security management for Member States from the Latin America and the Caribbean (GRULAC) region on 22 October 2020. The course offered a critical evaluation of audit methodologies for chemical facilities to minimise the risk of safety incidents. Moreover, the participants studied methods of safeguarding the chemical plant supply chain security against both external and internal threats. The programme was attended by 59 participants from the following 15 Member States: Barbados, Brazil, Chile, Colombia, Cuba, Ecuador, El Salvador, Grenada, Guatemala, Mexico, Nicaragua, Panama, Peru, Saint Kitts and Nevis, and Uruguay.
35. The Secretariat organised an online training programme on chemical safety and security management for Member States from East and South-East Asia on 17 November 2020. The programme focused on a scenario-based approach to process safety and security management, as well as hazardous chemical supply chain security management strategies aimed at the prevention of chemical accidents and incidents. The programme was attended by 21 participants from government agencies, academia, the chemical industry, and the defence sector from eight Member States: Cambodia, Indonesia, Malaysia, Mongolia, the Philippines, Timor-Leste, Turkmenistan, and Viet Nam.

¹

Launched in 2009, the Chemical Safety and Security Management Programme is an international cooperation programme designed initially to focus on the chemical industry and industry-related aspects of the implementation of the Convention, specifically on chemical safety and security at the plant level in the development, storage, production, handling, transportation, and distribution of chemicals. Under this Programme, seminars are held in order to meet the increasing need for specific training in safety and security with regard to the rapidly expanding and increasingly complex chemical industry. Through the seminars, OPCW Member States and their industries are provided with the tools and knowledge required to mitigate the risks arising from chemical industry accidents and the threat of terrorism, and with a platform for sharing experience. With this in mind, participants are familiarised with the new approaches that can be adopted in relation to safety and security management, focusing on small and medium-sized enterprises. By promoting and disseminating standardised and best practices in chemical safety, the activities conducted in this area by the Secretariat benefit chemical industry personnel involved in safety management issues, enhance the capacities of National Authorities and chemical industry associations in Member States, and indirectly benefit the general public.

36. The Secretariat, in collaboration with the National Committee for the Prohibition of Weapons (NCPW) of Qatar, organised an online advanced course on chemical safety and security management for Member States from the Asia region on 23 February 2021. The workshop objective was to provide a better understanding of chemical security management, to minimise the risk of misuses of highly toxic chemicals, and to review the resources, tools, and skills required to promote chemical security standards. The programme also covered strategies to safeguard supply chains against both internal and external threats. Expert trainers from the OPCW, the NCPW, the United Nations Office on Drugs and Crime, INTERPOL, and the International Labour Organization led participants through interactive learning sessions. The workshop brought together chemical safety and security specialists from Asia, including representatives of the chemical industry, industry associations, National Authorities, government departments, the defence sector, and academia. The programme was attended by 101 participants from the following 15 Member States: Afghanistan, Bangladesh, Bhutan, Cambodia, Germany (observer), India, Indonesia, Malaysia, Myanmar, Pakistan, the Philippines, Qatar, Spain (observer), Sri Lanka, and Viet Nam.
37. The Secretariat held an online training course on chemical security vulnerability assessment and audit for stakeholders in South-Eastern Europe on 26 February 2021, in collaboration with the Regional Arms Control Verification and Implementation Assistance Centre in Croatia. The course focused on chemical plant security elements and management strategies, chemical supply chain vulnerability assessment, and process safety management and audit for chemical plants. The workshop was attended by 28 participants from nine States Parties: Albania, Bosnia and Herzegovina, Croatia, Germany (observer), Italy (observer), Montenegro, North Macedonia, Serbia, and Turkey.
38. On 1 April 2021, the Secretariat organised an online forum on the peaceful uses of chemistry entitled “New Norms for the OPCW Capacity-Building Programmes after the COVID-19 Pandemic”. Lessons learned and best practices regarding online capacity-building programmes were shared, and both needs and gaps were identified, in particular with regard to chemical safety and security management following the COVID-19 pandemic. The forum was attended by 37 participants from 12 African States Parties: Algeria, Botswana, Burkina Faso, Kenya, Mauritius, Morocco, Mozambique, the Niger, Nigeria, Uganda, Sierra Leone, and the Sudan, with representatives from the University of Wuppertal of Germany sharing their expertise during the forum.
39. The Secretariat organised an online workshop on general aspects of chemical safety and security in laboratories from 8 to 10 June 2021. This event was organised by the OPCW in partnership with the Italian National Research Council and the Italian Federation of the Chemical Industry, Federchimica. The workshop focused on best practices and knowledge in respect of hazardous chemicals and related risk assessment, personal protection equipment, emergency management, environmental impact, and sustainability. Participants from the chemical industry, research and academia, governmental agencies, and policy-making institutions also took part in a table-top exercise using a scenario involving hazardous chemicals to test emergency response and risk-assessment skills. The workshop accommodated 45 participants from 17 States Parties: Colombia, Cuba, India, Iraq, Italy, Malawi, Malaysia, Mauritius, Oman, Pakistan, Poland, Portugal, Romania, Tajikistan, Tunisia, Turkey, and Uruguay.

40. On 29 June 2021, the Secretariat organised an online event to launch the “Indicative Guidelines for Chemical Safety and Security in Small and Medium-Sized Enterprises to Foster the Peaceful Uses of Chemistry”, an outcome of the workshops on developing tools for chemical safety and security organised in 2019. This non-binding document, the first of its kind, contained a series of best practices in this field, to which the chemical industry may refer in its endeavour to enhance safety and security management and, ultimately, prevent and reduce incidents and accidents at chemical facilities. Representatives from the United Nations Environment Programme, the International Council of Chemical Associations (ICCA), Brazil, China, Germany, Italy, and the United States of America shared their experience during the launch. The event gathered over 120 participants from the following Member States: Algeria, Argentina, Bangladesh, Belarus, Brazil, Cameroon, China, Costa Rica, Croatia, Cuba, Ethiopia, Germany, Ghana, Guatemala, India, Indonesia, Ireland, Italy, Madagascar, Malaysia, Maldives, Mexico, Myanmar, Nigeria, Oman, Pakistan, the Philippines, Poland, Qatar, Saint Vincent and the Grenadines, Saudi Arabia, Seychelles, Spain, Togo, Turkey, the United Arab Emirates, the United States of America, Venezuela (Bolivarian Republic of), and Zambia.
41. The Secretariat organised an online advanced course on chemical safety and security management for African Member States on 2 July 2021. The course focused on the development of national action plans to manage chemical assets in Member States, with a view to the prevention of accidents and incidents, and was attended by 29 participants from 12 Member States: Burkina Faso, Ethiopia, Kenya, Mauritania, Mozambique, Nigeria, Seychelles, the Sudan, Togo, Tunisia, Uganda, and Zimbabwe.
42. The Secretariat organised an online advanced course on chemical safety and security management for Member States in the GRULAC region on 22 July 2021. The course provided the components required to develop a national action plan on chemical safety and security management, including hazard communication, along with a table-top exercise, and was attended by 25 participants from nine Member States: the Bahamas, Brazil, Colombia, Cuba, Ecuador, Nicaragua, Peru, Trinidad and Tobago, and Uruguay.

Other initiatives

43. The University of Wuppertal in Germany, in partnership with the OPCW, held an online course on explosion protection and error management from 7 to 30 September 2020. The course included e-learning and live sessions with experts from the University of Wuppertal and benefitted 24 participants from OPCW Member States in the Africa, Asia, and GRULAC regions. A wide range of stakeholders participated, including representatives from governments, National Authorities, the chemical industry, and academia, from the following States Parties: Burkina Faso, Burundi, Cameroon, Chile, Colombia, Costa Rica, Cuba, El Salvador, the Gambia, Indonesia, Iran (Islamic Republic of), Iraq, Kenya, Morocco, Namibia, Nigeria, Pakistan, Saint Vincent and the Grenadines, Saudi Arabia, Senegal, Sri Lanka, Uganda, and Zimbabwe. The course was funded by the Government of Germany.

44. The Secretariat, in collaboration with the Russian Chemists Union, organised an online workshop from 14 to 18 June 2021 on best practices to develop the Responsible Care® initiative for the chemical industry. The workshop provided an update on the Responsible Care® initiative, focusing on sustainability, safety, and security in the chemical industry. The event was provided to environmental health and safety managers, qualified technologists, and representatives of chemical industry associations and governmental organisations from Russian-speaking Member States of the OPCW. Twenty participants from seven States Parties enhanced their knowledge of environmental protection and environmental technologies, labelling of chemicals, integrated systems for chemical safety and security management, occupational medicine, and health protection.

ENHANCEMENT OF LABORATORY CAPABILITIES

45. The Secretariat has continued to provide capacity-building programmes for participants from developing countries and countries with economies in transition to assist their efforts in building or further enhancing their laboratory capacities. The programmes include analytical skills development courses (including the basic course for women chemists), the Laboratory Twinning and Assistance Programme, proficiency testing training, customs laboratory training, and the Equipment Exchange Programme. During the reporting period, a total of 54 participants from the following 14 States Parties benefitted from these programmes: Bangladesh, Brazil, Chile, Finland, Germany, Kenya, Morocco, Nigeria, Spain, Sri Lanka, Tunisia, Uganda, the United Kingdom of Great Britain and Northern Ireland, and the United Republic of Tanzania.
46. The analytical skills development courses are aimed at assisting qualified analytical chemists in acquiring further experience and practical skills in the analysis of chemicals related to the Convention. Additionally, these courses serve to:
- (a) enhance national capacity in analytical chemistry for personnel from industry, academic institutions, and government laboratories in the States Parties sending participants;
 - (b) facilitate the adoption of good practices in laboratories supporting national implementation of the Convention, trade, and economic development; and
 - (c) broaden the pool of human resources from which National Authorities and the Secretariat can draw in the future.
47. The laboratory skills enhancement courses focus either on building skills in using specific techniques, such as quantitative mass spectrometry (QMS) and nuclear magnetic resonance (NMR), to analyse chemicals related to the Convention, or on improving the quality and proficiency of laboratory work through sound management practices. These are two-week courses, each for a maximum of four participants who already have practical experience in liquid chromatography (LC), gas chromatography (GC), mass spectrometry (MS), or NMR techniques. Participants are introduced to the preparation of samples and are then given demonstrations and practical exercises on these techniques. The courses also cover the theoretical aspects of LC and GC, LC-MS, GC-MS, NMR, quality assurance, and instrument maintenance.

48. In addition to the established programmes in the area of enhancement of laboratory capabilities, the Secretariat has continued with the Laboratory Twinning and Assistance Programme (a merger of the former Laboratory Twinning initiative and Laboratory Assistance Programme) funded through a voluntary contribution from the European Union. The programme is aimed at improving the technical competencies of laboratories in States Parties with economies that are either developing or in transition for participation in the OPCW proficiency tests. The programme is based on the provision of mentorship and exchange of knowledge from more advanced laboratories, which preferably already hold OPCW designated laboratory status.

Laboratory Twinning and Assistance Programme

49. In early 2020, two memoranda of understanding were signed between Protechnik Laboratories in South Africa (receiving assistance), the Netherlands Organisation for Applied Scientific Research (TNO) (providing assistance), and the Secretariat. TNO, an OPCW designated laboratory, is offering its resources, with support from the Secretariat, to implement a series of training and mentorship visits to both sites, with the aim of enhancing the capacity of Protechnik in the analysis of environmental and biomedical samples and helping it to regain OPCW designation. Since then, the COVID-19 pandemic has prevented realisation of any of the planned activities. The first activity, the technical evaluation visits, will begin as soon as the current travel restrictions imposed as a consequence of the COVID-19 pandemic have been removed.
50. The Secretariat has received a number of expressions of interest for participation in the programme from the following laboratories: the Finnish Institute for Verification of the Chemical Weapons Convention (VERIFIN); the Laboratory for Instrumental Analysis, Institute of Chemistry, Technology and Metallurgy, University of Belgrade, Serbia; the National Forensic Laboratory, Morocco; and the Analytical Chemistry and Environmental Science Department, Training Institute for Chemical Industries, Bangladesh. The Secretariat has made a comprehensive evaluation of the applications received, conducted initial discussions with applicants, and has initiated the process of identification of potential twinning partners for these laboratories or consolidation of the twinning schemes.
51. A technical evaluation visit regarding another twinning project between the Bundeswehr Research Institute for Protective Technologies and CBRN² Protection in Germany (as assisting laboratory) and the National Institute of Criminalistics and Criminology of the National Gendarmerie in Algeria (as assisted laboratory) took place on 5 and 6 August 2021. Through the visit, the existing capacities, circumstances, and challenges of the Algerian laboratory were identified. A project plan will be finalised based on the outcome of the visit and the project will be officially initiated after the signature of memoranda of understanding between the Secretariat and the two laboratories.
52. Additionally, the second phase of the Project on Assessing and Enhancing Capacity of Analytical Laboratories from African and GRULAC Member States, funded through a voluntary contribution from the United Kingdom of Great Britain and Northern Ireland, has been successfully concluded. The project aims at enhancing the capacity of laboratories from the GRULAC and Africa regions seeking OPCW designation. The

second phase resulted in further progress being made towards the aim of the project by seven laboratories in Brazil (2), Chile (3), Kenya (1) and Nigeria (1). Various capacity-building activities for these laboratories were organised in cooperation with Finland and Spain. The United Kingdom of Great Britain and Northern Ireland has announced its intention to continue funding the project in 2021 and 2022; the memorandum of understanding in this regard is under preparation.

Analytical skills development courses and proficiency testing training

53. During the reporting period, five analytical chemistry courses were organised for the benefit of 54 participants from 14 States Parties. These included one online laboratory skills enhancement course and two online proficiency testing workshops in collaboration with VERIFIN in Helsinki, Finland; one online proficiency testing training activity in collaboration with the Laboratorio de Verificación de las Armas Químicas (LAVEMA) in Madrid, Spain; and one online workshop on the Project on Assessing and Enhancing Capacity of Analytical Laboratories from African and GRULAC Member States.
54. Two specialised online training courses (one on LC-MS and one on laboratory quality management) took place from 7 to 11 September 2020 via an online platform. The course provided an overview of the OPCW and the Convention, including its verification provisions. It also covered sample preparation, quantification, compound identification, and laboratory quality management based on standard ISO 17025 of the International Organization for Standardization. The courses hosted seven participants from seven Member States: Bangladesh, Morocco, Nigeria, Sri Lanka, Tunisia, Uganda, and the United Republic of Tanzania.
55. The Secretariat organised an online proficiency tests training course from 11 to 25 March 2021 for GRULAC States Parties. The course was organised within the framework of the Project on Assessing and Enhancing Capacity of Analytical Laboratories from African and GRULAC Member States. Training support was provided to laboratories that aspire to pass the stringent proficiency tests required to become OPCW designated laboratories. To advance their capabilities, candidate institutes partner with designated laboratories from other Member States for a range of training and mentoring activities. The course accommodated 12 participants from Brazil and Chile, and focused on the advanced strategies and procedure required to pass OPCW designated laboratory proficiency tests—the primary requirement for laboratories to obtain and maintain OPCW designation.
56. The Secretariat organised an online proficiency testing training course from 15 to 19 March 2021 for African States Parties. The course was organised within the framework of the Project on Assessing and Enhancing Capacity of Analytical Laboratories from African and GRULAC Member States. The training also focused on the in-depth strategies and procedures required to pass OPCW proficiency tests. The course accommodated 17 participants from Kenya and Nigeria. The course combined theory modules and practical exercises, and covered elements related to participation in OPCW proficiency tests, such as sample treatment, analytical techniques, micro synthesis, test criteria, and reporting.

57. On 8 April 2021, the Secretariat organised an online closing workshop for the 2020-2021 phase of the Project on Assessing and Enhancing Capacity of Analytical Laboratories from African and GRULAC Member States. The workshop summarised the progress achieved and brought project participants together to discuss the way forward in the third phase of the project, covering the years 2021 and 2022. The workshop was attended by 18 participants from Brazil, Chile, Finland, Germany, Kenya, Nigeria, Spain, and the United Kingdom of Great Britain and Northern Ireland.

Equipment Exchange Programme

58. The Equipment Exchange Programme aims to support the transfer of used, but still functional, equipment from institutions in a State Party to those in another. During the reporting period, the Secretariat facilitated two equipment transfers and donations, the first from Germany to the United Republic of Tanzania and the second from Germany to the Sudan. As this programme is mainly based on donations of equipment by States Parties, the Secretariat maintains continuous contact with potential donors to encourage such donations.

CHEMICAL KNOWLEDGE PROMOTION AND EXCHANGE

59. The Secretariat has continued to promote networking and exchange among the scientific community, academic institutions, chemical industry associations, NGOs, and regional and international institutions through ongoing programmes, such as the Conference Support Programme, the Fellowship Programme, the Programme for Support of Research Projects, and a new series of awareness-raising programmes entitled “Building a Knowledge Society”. With a view to enhancing networking among scientists and their institutions, these programmes have provided a platform to a wide range of experts in the field of chemistry from both developing and developed countries to share their experience and knowledge.

Fellowship Programme

60. The Fellowship Programme assists scientists and engineers from States Parties with economies that are developing or in transition to gain experience by working in more advanced research laboratories and facilities in other States Parties for a limited period of time. A key objective of this programme is to facilitate the exchange of scientific and technical information, while at the same time strengthening the institutions in the targeted countries through capacity building.
61. One fellowship was sponsored during the reporting period. In addition, a number of fellowships are scheduled to start later in 2021. Details of the fellowships can be found in Annex 2.

Programme for Support of Research Projects

62. Under the Programme for Support of Research Projects, support is extended for small-scale research projects in States Parties in order to promote the development of scientific and technical knowledge in chemistry for industrial, agricultural, research, medical, pharmaceutical, and other peaceful purposes relevant to the Convention. Funding for such projects may be provided either solely by the OPCW or jointly with

another organisation. Currently, the Secretariat collaborates with the IFS in Stockholm, Sweden, to co-fund projects from developing countries.

63. During the reporting period, the Secretariat continued to support 23 research projects undertaken by nationals of Argentina (3), Brazil (2), Italy (2), Kenya, Malaysia (5), North Macedonia, Pakistan, Serbia (3), South Africa, Tunisia, Turkey, Uganda, and Uruguay, all of which were ongoing as at the cut-off date for this report. Details regarding the above-mentioned projects directly funded by the OPCW are provided in Annex 3.
64. Collaboration with the IFS to jointly fund research projects continued with the support of 13 projects from the following 10 States Parties: Benin (2), Côte d'Ivoire (2), Kenya, Nepal, Nigeria, Pakistan, Sri Lanka, Uganda, Viet Nam (2), and Zimbabwe. Details of the jointly funded projects are given in Annex 4.

Conference Support Programme

65. The Convention encourages the fullest possible exchange of scientific and technical information relating to the development and application of chemistry for purposes not prohibited under the Convention. The Conference Support Programme provides financial support for conferences, workshops, and seminars on special topics relevant to the Convention—generally by sponsoring scientists, technical personnel, and resource persons from States Parties to attend such events and by subsidising the cost of publications. Sponsorship is channelled through scientific institutions and conference organisers in States Parties.
66. During the period under review, three events were supported in order to facilitate the exchange of scientific and technical information in areas relating to the peaceful use of chemistry. As a result of the ongoing COVID-19 pandemic, two events were held online and one in hybrid format. A list of these conferences and the countries of sponsored participants is provided in Annex 1.

Building a Knowledge Society

67. The “Workshop on Toxic Chemicals in the Environment: from Understanding Pollution and its Impact to Removal and Verification Techniques” was held online on 25 and 26 November 2020. The workshop, held in cooperation with the IFS, provided an opportunity for scientists who have previously benefitted from the OPCW and joint OPCW-IFS funding to present the success of their research and other achievements. It also enabled participants to engage in discussion with the OPCW and IFS regarding their relevant programmes and to provide feedback, with a view to evaluating the programmes. The event served as an opportunity to launch a new OPCW publication, also entitled “Toxic Chemicals in the Environment: From Understanding Pollution and its Impact to Removal and Verification Techniques”. The publication presented the research of scientists who had previously received OPCW and OPCW-IFS grants. The workshop was attended by 15 participants, two of whom were observers, representing universities and research institutions of 13 States Parties: Argentina, Benin, Burkina Faso, Cameroon, China, India, Indonesia, Malaysia, Nigeria, Pakistan, South Africa, Sri Lanka, and Uganda.

Empowering women in chemistry

68. In order to further enhance the effectiveness and impact of the international cooperation programmes offered by the Secretariat to States Parties and based on the evaluation of gender balance in OPCW international cooperation programmes, the Women in Chemistry initiative was designed and launched as a tailor-made programme to promote the role of female chemistry professionals in advancing the peaceful uses of chemistry.
69. Under this initiative, the Secretariat organised the fifth edition of the symposium on women in chemistry on 1 July 2021 via an online platform. This year's symposium provided opportunities for the Secretariat to share relevant experience with the Member States on the OPCW's efforts to support gender mainstreaming and highlight opportunities for women to join the OPCW's capacity building programme. The symposium was attended by 172 participants from 64 States Parties: Afghanistan, Algeria, Argentina, Australia, Azerbaijan, the Bahamas, Bangladesh, Belarus, Botswana, Brazil, Burundi, Cameroon, Chile, China, Colombia, Costa Rica, Côte d'Ivoire, Croatia, El Salvador, Eritrea, Ethiopia, France, Georgia, Germany, Ghana, Guatemala, Guyana, India, Indonesia, Iraq, Ireland, Italy, Jordan, Kenya, Lebanon, Luxembourg, Malawi, Malaysia, Mali, Mexico, Morocco, Myanmar, Nicaragua, Nigeria, Pakistan, Peru, the Philippines, Poland, Portugal, Romania, Saint Vincent and the Grenadines, Samoa, Serbia, Seychelles, Sierra Leone, South Africa, Thailand, Togo, Turkey, Ukraine, the United States of America, Uruguay, Uzbekistan, and Zambia.

Review and evaluation workshop on the components of an agreed framework for the full implementation of Article XI

70. The Secretariat has continued with the series of workshops on Article XI, which provided an opportunity for stakeholders to review and evaluate the activities run by the Secretariat and States Parties to promote the peaceful uses of chemistry. The Secretariat organised the fifth edition of the review and evaluation workshop of the components of an agreed framework for the full implementation of Article XI via an online platform on 2 November 2020. Ninety participants from 51 States Parties representing National Authorities, Permanent Representations, and relevant stakeholders participated in the workshop, the aim of which was to facilitate discussions and an exchange of views among States Parties and relevant stakeholders to further the full implementation of Article XI of the Convention.

Interaction with the chemical industry

71. As mandated by the Third Review Conference³ (RC-3/3*, dated 19 April 2013) and C-16/DEC.10, the Secretariat has continued to develop relations and partnerships with chemical industry associations, in particular the ICCA and the International Chemical Trade Association. The cooperation with the chemical industry includes the exchange of information in the framework of the Chemical Industry Coordination Group, as well as support from chemical industry for activities related to chemical safety and security. More information on cooperation with chemical industry associations is available in the

³ Review Conference = Special Session of the Conference of the States Parties to Review the Operation of the Chemical Weapons Convention.

most recent annual Note by the Director-General on engaging the chemical industry associations (C-25/DG.14, dated 12 November 2020).

ENHANCING THE EFFECTIVENESS OF OPCW INTERNATIONAL COOPERATION PROGRAMMES

72. During the reporting period, special attention was given to formalising and strengthening the alumni networks of the programmes conducted by the Secretariat under Article XI. In addition to the vibrant alumni network of the Associate Programme, which was established in 2012, alumni networks have been established for other programmes such as the Chemical Safety and Security Management Programme, the Integrated Chemicals Management Programme, and the Women in Chemistry initiative. These networks constitute reliable channels for interaction with and among alumni of the various programmes, and have also proved to be instrumental for the sharing of experiences and best practices in terms of the objectives of the programmes during the post-implementation phase.
73. During the reporting period, the Secretariat launched the sixth edition of the survey on needs assessment and best practices on chemical safety and security management, inviting States Parties to share their specific needs in the area and to provide information on their existing tools, guidance, and best practices in this field. Thus far, the following 17 States Parties have provided their input: Algeria, Bahrain, Bosnia and Herzegovina, Colombia, Cuba, France, Italy, Montenegro, Morocco, Pakistan, Saudi Arabia, Serbia, Slovenia, Switzerland, Turkey, the United Kingdom of Great Britain and Northern Ireland, and the United States of America.
74. The Secretariat also supported the facilitator for Article XI issues, Mr Junaid Sadiq of Pakistan, in organising a series of informal consultations to provide States Parties with updates on the progress of the capacity-building programmes offered by the Secretariat in promoting the peaceful uses of chemistry.
75. Based on the progress made regarding the establishment of a drafting committee, Ms Fadhilah Halimatus Shifa Kusumaningrum, First Secretary of the Permanent Representation of Malaysia to the OPCW, was appointed co-facilitator for the full implementation of Article XI by the Council at its Ninety-Sixth Session, held from 9 to 12 March 2021 (EC-96/2, dated 12 March 2021). Ms Kusumaningrum is mandated to assist the facilitator in the coordinating process pertaining to the drafting committee.
76. Furthermore, to enhance the effectiveness of all of the OPCW's international cooperation programmes and activities, the Secretariat has continuously incorporated evaluation systems and tools to provide continuous review and improvement in programme design and delivery. The evaluation questionnaires address the content and continued relevance of the programmes, and feedback is taken into account when designing and updating the activities for the following year. Details of the evaluation of international cooperation programmes during the reporting period are given in Annex 5.

77. With regard to the Programme for Support of Research Projects, research proposals are assessed and evaluated by a review committee that includes two members of the Scientific Advisory Board. The criteria used to assess proposals and final reports include an examination of the scientific quality and the relevance of the project to the Convention.
78. A continuous evaluation of the Fellowship Programme is undertaken both at the proposal stage and at the conclusion of the fellowship. Evaluation reports are also received from the supervisor at the hosting institution, and the fellows are required to write a report.
79. Analytical skills development courses are evaluated through test exercises during and at the end of each course, and by means of a post-course evaluation meeting held with participants and trainers. Intermediate and final tests verify the knowledge participants have acquired, while questionnaires and post-course meetings collect feedback on the courses themselves and their perceived benefits to participants.
80. With regard to the Chemical Safety and Security Programme, feedback is requested at the end of workshops and then discussed in order to improve the delivery of future activities. In addition, the impact of various programmes is continuously assessed. Feedback from the National Authorities is also taken into account, especially during the annual National Authorities Day.
81. In light of the evaluation of the impact of international cooperation programmes, the Secretariat conducted a comprehensive survey of the Women in Chemistry initiative from 2016 to 2019 (including the symposium on women in chemistry and basic analytical chemistry courses for women chemists), inviting 132 former participants to take part. Out of the 132 former participants, 47 representatives from 35 States Parties responded to the survey, encompassing 36% of all participants. Annex 6 provides an overview of the impact review results. This study was performed to cover relevant information, such as the initial project concept, the Secretariat Note calling for applications or nominations, the training programme, and the course evaluation results. Inputs also included structured questionnaires that were sent to the programme participants, participants' supervisors, and National Authorities. The feedback enables the Secretariat to identify the needs of States Parties and optimise the programmes in the future.
82. The responses received as part of this evaluation highlighted the impact of the initiative on the participants and on their respective institutions. Participants shared the knowledge and experience gained from the initiative in several activities, including giving presentations to their colleagues, training activities, awareness and outreach programmes, and improvement of analytical procedures in the implementation of the Convention. Furthermore, participation in the courses had a direct impact on participants' job and their agency, institution, or organisation. Most of the participants utilised the experience and knowledge gained from the initiative in their professional sphere.
83. Based on the questionnaire, the impact on the participants after taking part in the Women in Chemistry initiative activities was observed by their supervisors. The evaluation shows that the supervisors utilised the participants' expertise in many ways, including the provision of training for colleagues and students; acting as resource persons in the agency, institution, or organisation; and the provision of outreach and awareness programmes on chemical analysis skills. Participants have also been assigned to carry

out more specific analysis in their agencies, with a view to improving analytical procedures. Supervisors also provided information on the benefits gained by the agencies, in particular practical improvements that participants introduced to their working environment by inculcating practical experience and familiarisation with current techniques for chemical analysis.

84. National Authorities reviewed the impact of the initiative at the national level and commented that it effectively supports States Parties in training more competent female personnel to implement the Convention, and creates a talent pool for the analysis of Convention-related chemicals. In addition, the evaluation shows that the initiative had a great impact on the participants' career development and ability to aid the National Authority in many ways. National Authorities also commented on the activities that had been conducted in the States Parties and on their positive impact on the national implementation of the Convention, including the provision of platforms for participants to share knowledge and experience.
85. Overall, the feedback has been positive regarding the content of the courses and a number of follow-up activities. The initiative inspired more women to participate in the international cooperation programmes and assisted participating States Parties in implementing the Convention more efficiently by creating mutual accountability among stakeholders. Furthermore, the international cooperation activities under this initiative created a platform for cooperation and mutual understanding between relevant stakeholders, with more engagement by women in the roles and responsibilities in respect of supporting the National Authorities in implementation of the Convention.

MEASURES BY STATES PARTIES AND THE OPCW TO FACILITATE STATES PARTIES' PARTICIPATION IN THE FULLEST POSSIBLE EXCHANGE OF CHEMICALS, EQUIPMENT, AND SCIENTIFIC AND TECHNICAL INFORMATION RELATING TO THE DEVELOPMENT AND APPLICATION OF CHEMISTRY, IN ACCORDANCE WITH THE PROVISIONS OF THE CONVENTION

86. Throughout the reporting period, the Secretariat continued to support the facilitator on Article XI issues, including during the informal consultations between States Parties in regard to the full implementation of this specific article of the Convention, which is aimed at the economic and technological development of the States Parties.
87. In order to enhance communication among all stakeholders, information about programmes, activities, and outcomes relating to the Convention, specifically Article XI, was shared through various platforms such as seminars and workshops, especially those organised by the Secretariat. The Secretariat has also produced informal papers and reports of relevant events in order to enhance the sharing of information and the dissemination of knowledge.

FINANCIAL ASPECTS

88. The activities covered during the reporting period were funded through the OPCW's annual Programme and Budget. In addition, voluntary contributions were received from States Parties for specific events.

**OVERSIGHT BY THE CONFERENCE OF THE STATES PARTIES AND THE
EXECUTIVE COUNCIL**

89. In accordance with decision C-16/DEC.10, the Secretariat reports to each annual session of the Conference on the progress made in implementing the decision and on the status of implementation of Article XI, in order to consider and take appropriate measures, if necessary, to further promote its full implementation.
90. During the Ninety-Seventh Session of the Council (6 to 8 July 2021), the Secretariat circulated a presentation to update the Council on the programme of activities related to the implementation of Article XI.

Annex 1

CONFERENCES SUPPORTED UNDER THE CONFERENCE SUPPORT PROGRAMME 26 AUGUST 2020 TO 25 AUGUST 2021

No.	Conference Title	Location	Duration	State Party of Sponsored Participants	Number of Sponsored Participants
1.	Virtual Conference on the 2nd International Conference on CBRNe – SICC Series	Rome, Italy	10 –12 December 2020	Afghanistan, Brazil (3), Cuba, Lebanon (2), Madagascar, Nigeria (4), India (3), Iran (Islamic Republic of), Iraq (23), Pakistan (2), Tunisia, Uruguay, Ukraine (2), Zambia (3)	48
2.	Green Chemistry Postgraduate Summer School 2021 (online and in-person event)	Venice, Italy	4 – 10 July 2021	Algeria (2), Argentina (5), Brazil (4), Cameroon (2), Democratic Republic of the Congo, Eritrea, Ethiopia, France, Ghana, India (2), Indonesia, Iraq, Kazakhstan, Kenya (3), Lithuania, Malaysia, Mexico (2), Morocco (3), Nigeria (6), Portugal, Romania, Rwanda, South Africa (8), Syrian Arab Republic, Tunisia (2), Uganda, Ukraine, Uruguay, Uzbekistan (3), Yemen, Zambia, Zimbabwe (4)	64
3.	Virtual Conference on Chemistry and its Applications, University of Mauritius	Port Louis, Mauritius	9 – 13 August 2021	100 participants (80% from Africa)	100

Annex 2

PROJECTS CONDUCTED UNDER THE FELLOWSHIP PROGRAMME 26 AUGUST 2020 TO 25 AUGUST 2021

No.	Title of Project	Location of Fellowship	Duration	State Party of Fellow
1.	Fellowship on the development of new green technique for separating complex mixtures of pharmaceutical residues using supercritical fluid chromatography	École Supérieur de Physique et de Chimie Analytique de la Ville de Paris (ESPCI), Paris, France	25 June – 12 September 2021	Jordan
2.	Fellowship: organic skills development	Scheduled to take place at Spiez Laboratory, Spiez, Switzerland	30 August – 26 November 2021	Zimbabwe
3.	Fellowship: NMR specialist	Scheduled to take place at VERIFIN, Helsinki, Finland	1 November 2021 – 30 April 2022	Serbia
4.	Fellowship: MS chemist	Scheduled to take place at VERIFIN, Helsinki, Finland	1 November 2021 – 30 April 2022	Uganda

Annex 3

**RESEARCH PROJECTS FUNDED DIRECTLY BY THE OPCW
26 AUGUST 2020 TO 25 AUGUST 2021**

No.	Title	State Party of Researcher	Status
1.	Development and characterisation of nanostructured surfaces, oriented to recovering and monitoring heavy metals in industrial process waters	Argentina	Ongoing
2.	Polyethylene mulching in agriculture: the interaction between plastic, soil, pesticides, and phthalic esters	Argentina	Ongoing
3.	Hybrid bio-nanomaterials: tools for the development of highly sensitive analytical methods applied to the determination of toxic elements in baby food	Argentina	Ongoing
4.	Development of fast analytical methods for identification of toxic chemicals using mobile GC-MS equipment	Brazil	Ongoing
5.	Development of polymer-based nanostructured sensors for detection of hydrogen sulfide (h ₂ s)	Brazil	Ongoing
6.	Chemistry beyond chlorine: dialkyl carbonates for biomass upgrading and synthesis of heterocycles	Italy	Ongoing
7.	Application of miniaturised sensors and sampler to remotely controlled mini aerial vehicles (payload less than 25 kg), a new pathway for the survey of critical areas	Italy	Ongoing
8.	Design and fabrication of chemo-sensor for food-borne mycotoxins as potential chemical warfare agents	Kenya	Ongoing
9.	Towards oxygen tolerant cross-coupling reactions in aqueous media for the developing world in the interest of safer molecular electronics: an attempt at reducing solvents and toxic chemicals dependency	Malaysia	Ongoing
10.	Palm oil activated carbon-based nanocomposite as magnetic solid phase extraction sorbents for rapid and efficient separation of polar organochlorine pesticides	Malaysia	Ongoing
11.	Mesoporous silica nanoparticles extracted from oil palm fronds for the development of magnetic solid phase extraction method for efficient separation of organochlorine pesticides in water samples	Malaysia	Ongoing
12.	Development and validation of electromembrane extraction with a new conductive polymer inclusion membrane sampling probe for simultaneous determination of cationic and anionic pesticides in environmental waters	Malaysia	Ongoing

No.	Title	State Party of Researcher	Status
13.	Development and application of new alginate encapsulated multiwall carbon nanotube micro-beads for extraction of lead ions from water samples	Malaysia	Ongoing
14.	Risk analysis of natural toxic pyrrolizidine alkaloids in the food chain: development, validation, and application of HPLC/MSn methods	North Macedonia	Ongoing
15.	Chemical fingerprinting of the poisonous plants of Pakistani origin by mass spectrometric methods	Pakistan	Ongoing
16.	Diagnosis of schizophrenia and bipolar disorder by NMR-based metabolomics and lipidomics	Serbia	Ongoing
17.	Detection of herbs and dietary supplements fraud using metabolomics approach	Serbia	Ongoing
18.	Development of online GC-MS and LC-MS methods based on micro extraction in packed sorbent (MEPS) for the OPCW proficiency test framework and on-site analysis	Serbia	Ongoing
19.	Monitoring the distribution of emerging micro pollutants in food crops irrigated with reclaimed water	South Africa	Ongoing
20.	Development of a robust field arsenic speciation method to separate lewisite compound using an GC/ICP/MS	Tunisia	Ongoing
21.	A novel approach to chlorine exposure: Raman spectroscopy Part II	Turkey	Ongoing
22.	Advancement of safe natural products for the treatment of malaria	Uganda	Ongoing
23.	Turning industrial waste into value-added chemical products	Uruguay	Ongoing

Annex 4

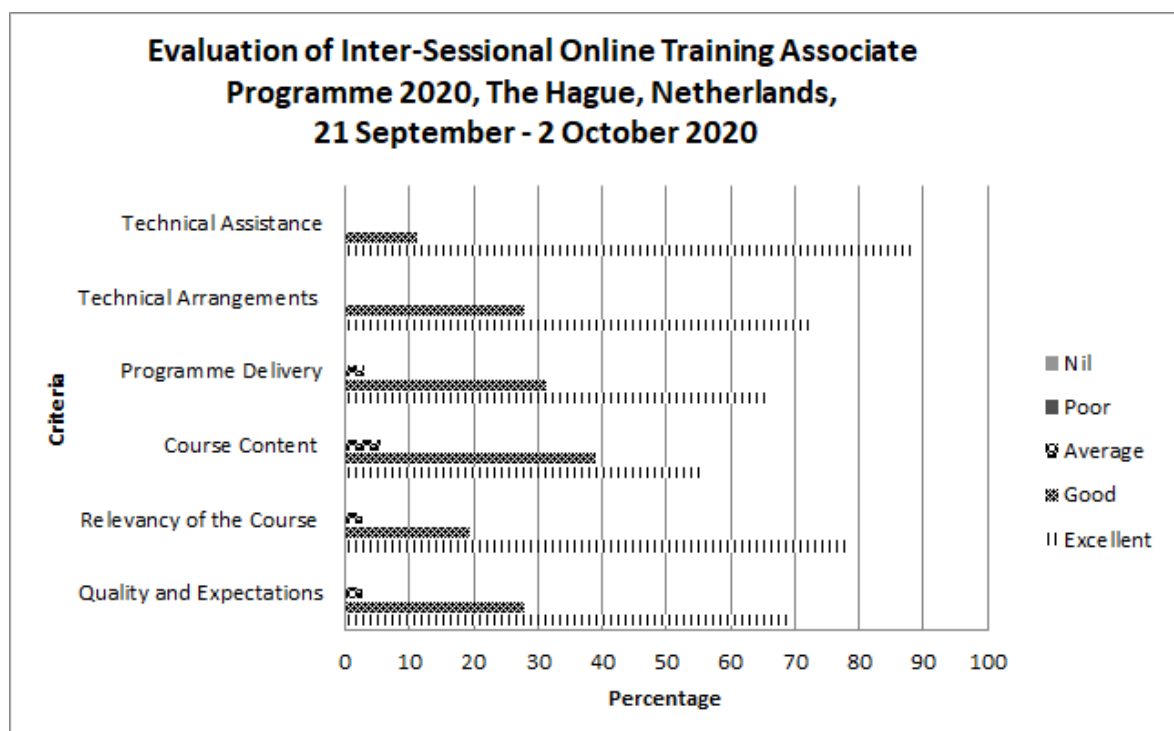
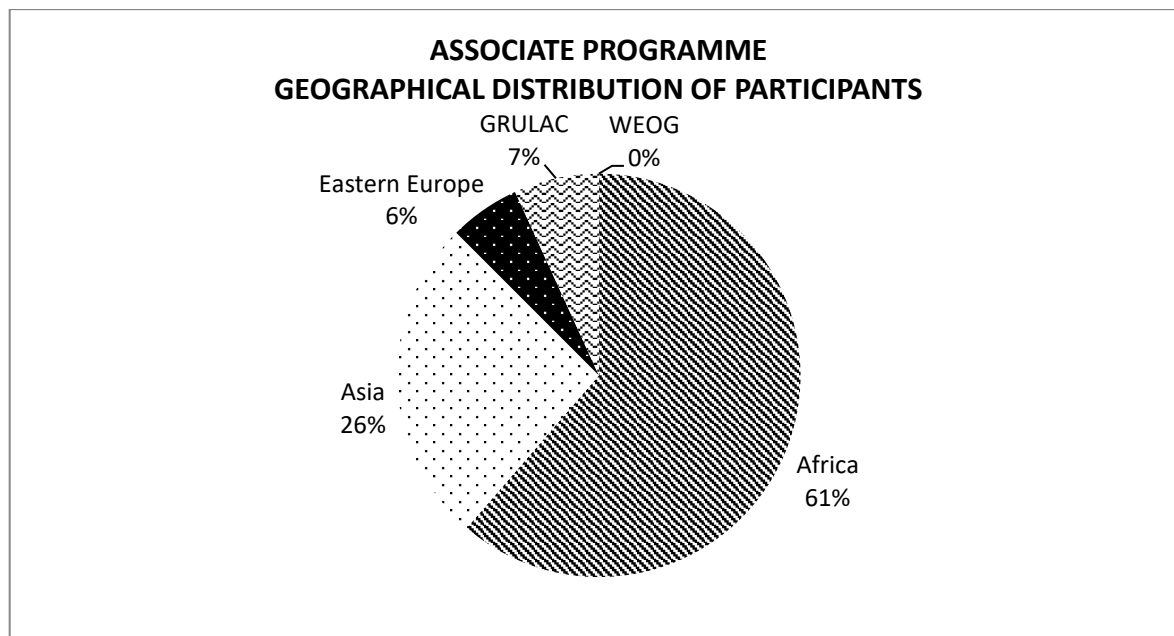
**RESEARCH PROJECTS FUNDED JOINTLY WITH
THE INTERNATIONAL FOUNDATION FOR SCIENCE
26 AUGUST 2020 TO 25 AUGUST 2021**

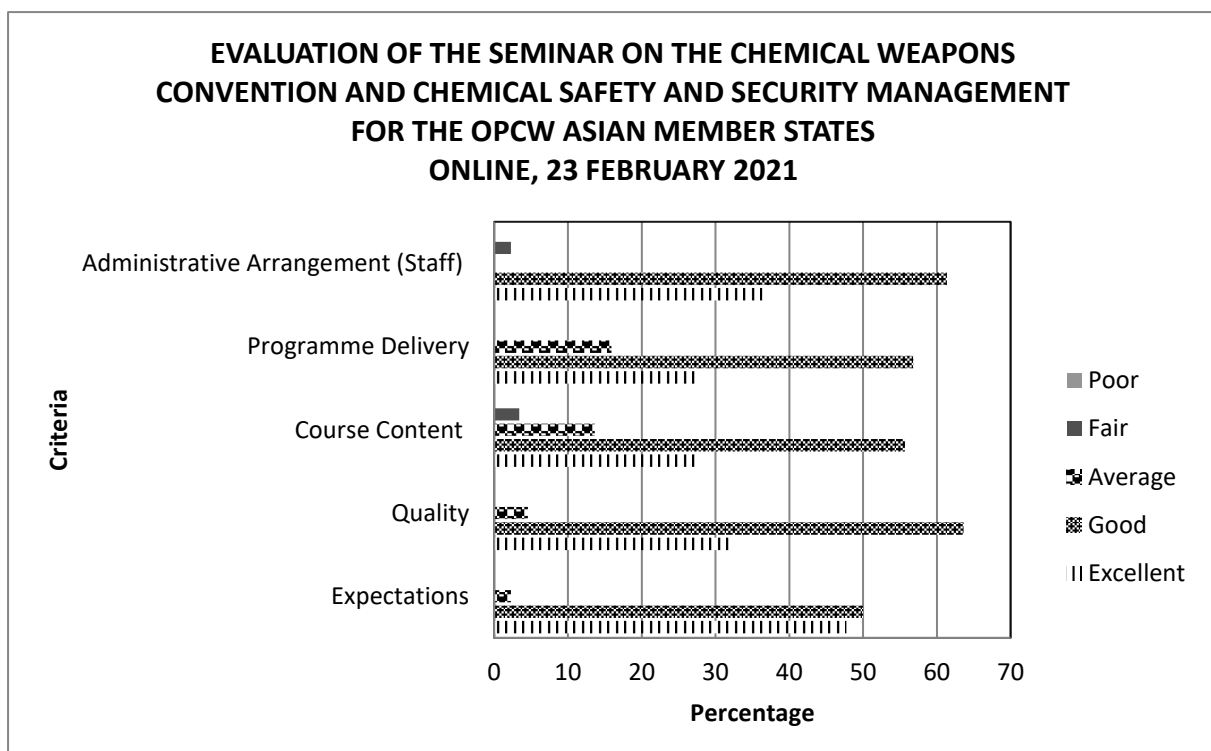
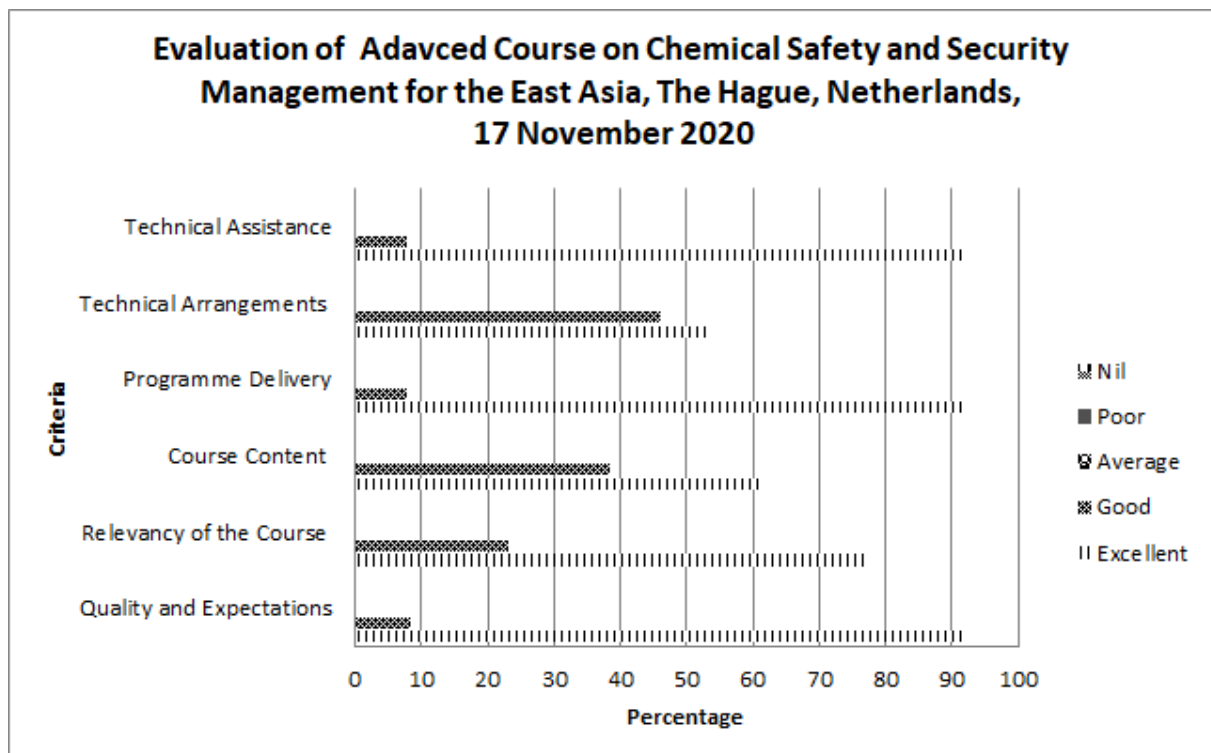
No.	Title	State Party of Researcher
1.	Ecohydrological modelling for the understanding of pollutants transfer dynamics in Hlan river basin, Southern Benin	Benin
2.	Evaluation of the larvicidal effect of three vegetable oils and cashew nut shell liquid, in the management of <i>Plutella xylostella</i> L. (Lepidoptera, plutellidae), and <i>Helicoverpa armigera</i> (Hübner) (Lepidoptera: Noctuidae) in market gardening in Benin	Benin
3.	Valorisation of pig manure into biogas and determination of microbiological and chemical risks related to the use of digestate as a bio-fertiliser in the peri-urban areas of the Abidjan district	Côte d'Ivoire
4.	Development of a biodegradable film with bioactive components for the packaging of "attieke"	Côte d'Ivoire
5.	Adsorption of perfluoroalkyl acids from wastewater onto water hyacinth based nanofibers: thermodynamics, kinetics, isotherms and mechanisms	Kenya
6.	Toxicity (embryonic, teratotoxicity) study of medicinal plants from Himalayan region of Nepal using zebra fish embryos	Nepal
7.	Development and quality evaluations of nano-emulsions of <i>Moringa oleifera</i> seed extracts for water purification	Nigeria
8.	Fabrication of novel plant-based copolymers and their scrutinisation as xenobiotic remediators for pharmaceutical and textile wastewater effluents	Pakistan
9.	Green synthesis of metal nanoparticles using invasive plant species in Sri Lanka for the development of effective disinfectants to nosocomial infections.	Sri Lanka
10.	Evaluation of the mycobacterium tuberculosis growth inhibitory and / or killing potential of isolated chemical compounds from selected medicinal plants of the Fabaceae family (<i>Erythrina abyssinica</i> , <i>Entada abyssinica</i> , and <i>Albizia coriaria</i>).	Uganda
11.	Advanced fabrication of aerogel from graphene oxide and cellulose for wastewater treatment	Viet Nam
12.	Study of removal of natural organic matter from surface water using coagulation and flocculation to mitigate the formation of chlorine disinfection by-products: a case study of Thu Duc Water Treatment Plant, Ho Chi Minh City, Viet Nam	Viet Nam
13.	Soil health improvement technologies to enhance drought and nutrient resilience in urban agro ecosystems in Zimbabwe	Zimbabwe

Annex 5

EVALUATION OF INTERNATIONAL COOPERATION PROGRAMMES

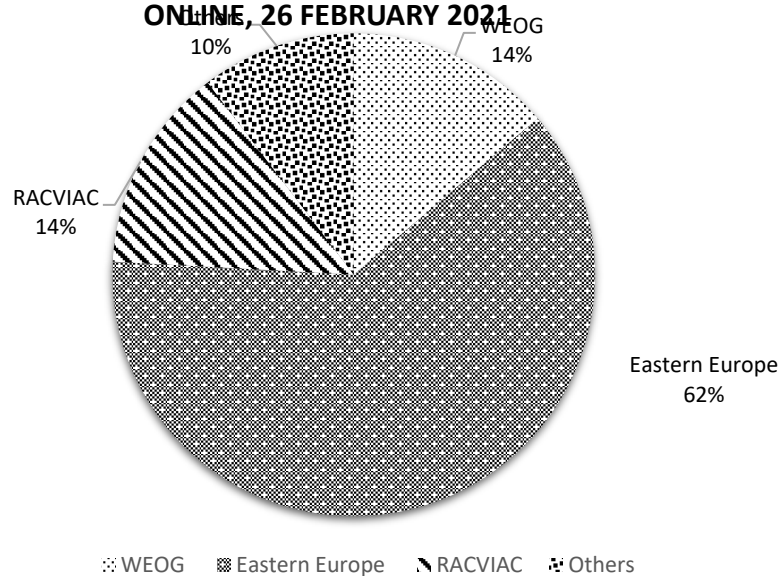
1. INTEGRATED CHEMICALS MANAGEMENT





**EVALUATION OF THE CHEMICAL SECURITY VULNERABILITY
ASSESSMENT AND AUDIT FOR SOUTH EASTERN EUROPE MEMBER
STATES IN COLLABORATION WITH RACVIAC**

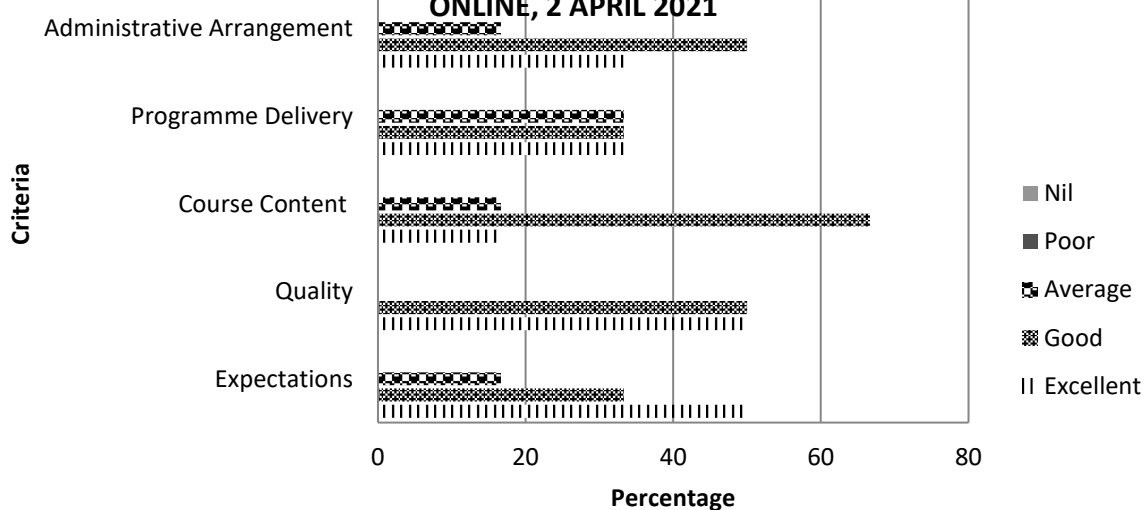
ONLINE, 26 FEBRUARY 2021

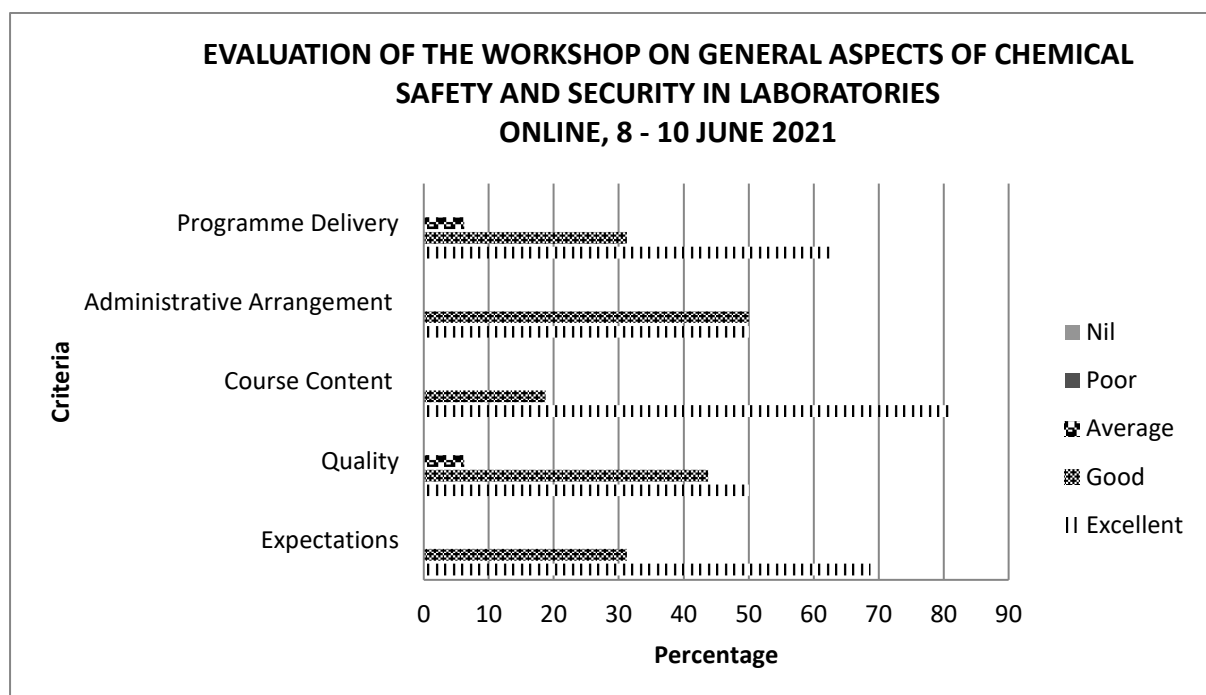
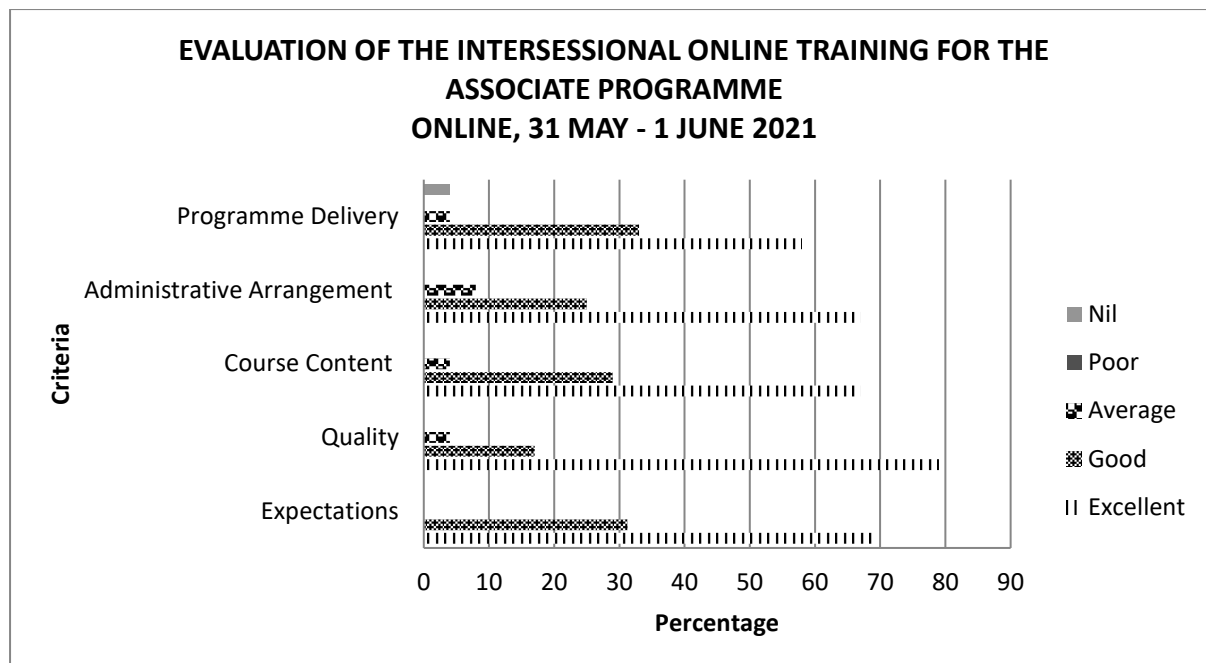


**EVALUATION OF THE FORUM ON THE PEACEFUL USES OF CHEMISTRY:
NEW NORMS FOR OPCW CAPACITY-BUILDING PROGRAMMES**

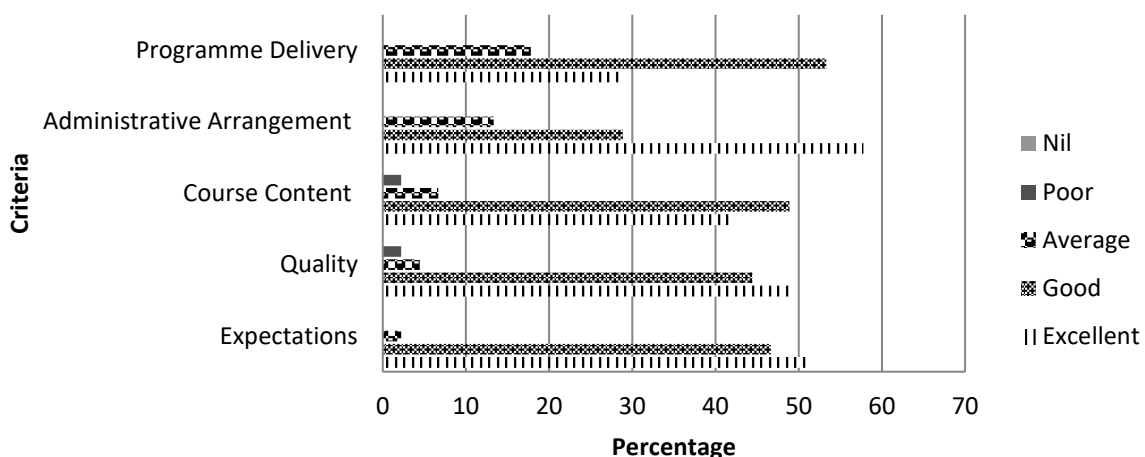
AFTER COVID-19

ONLINE, 2 APRIL 2021

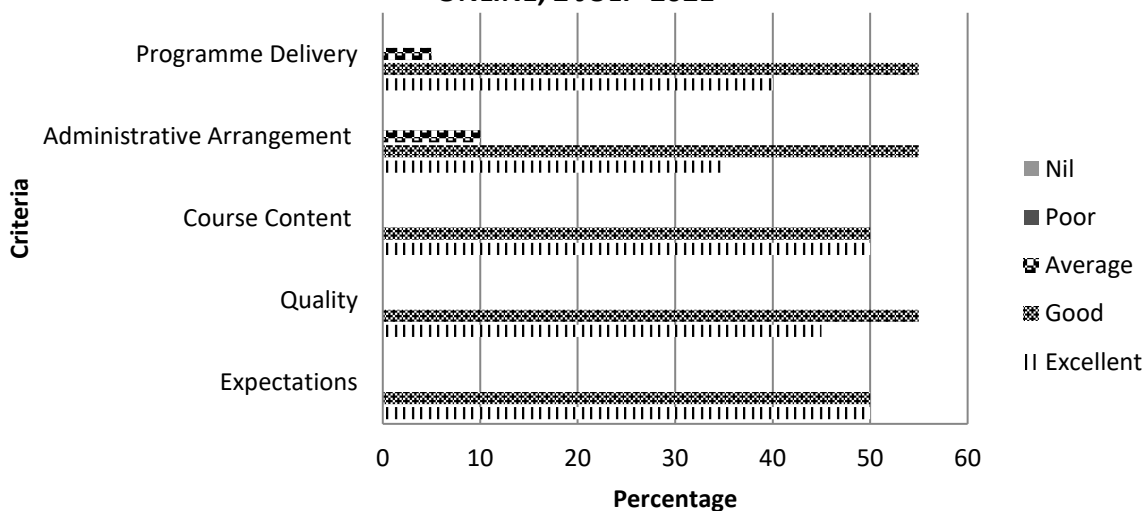


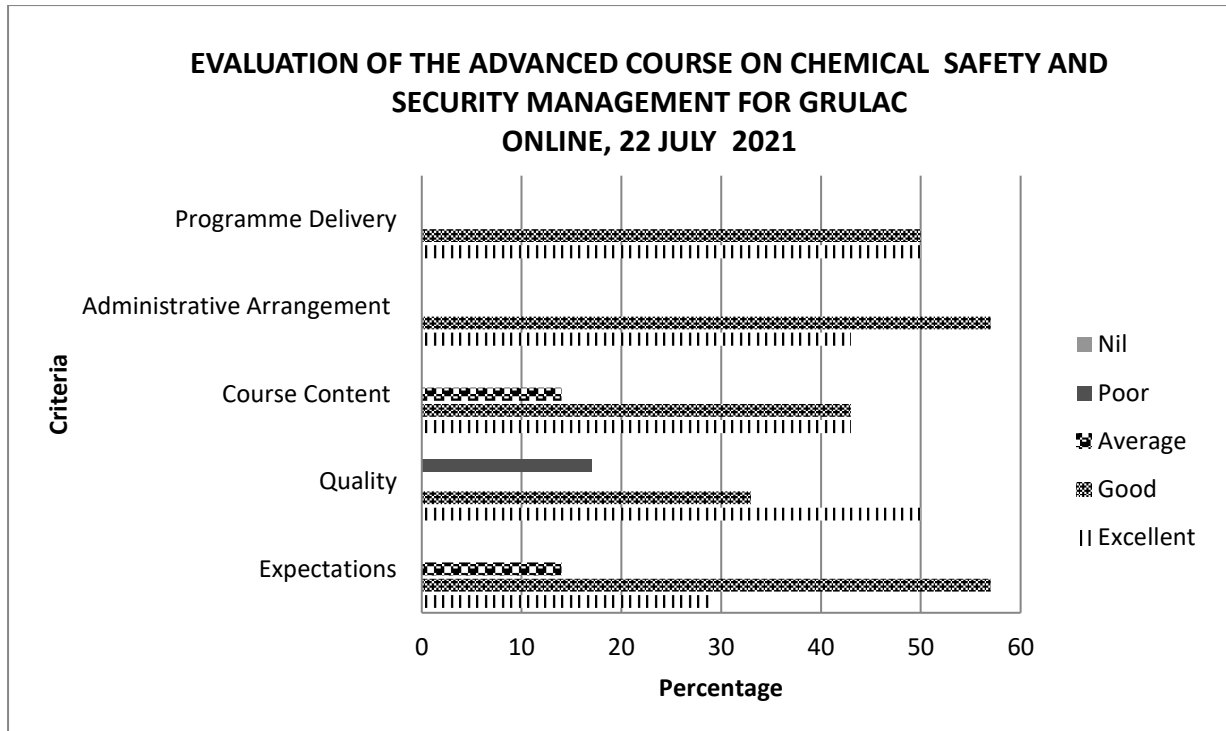


**EVALUATION OF THE LAUNCH EVENT: INDICATIVE GUIDELINES FOR
CHEMICAL SAFETY AND SECURITY IN SMALL AND MEDIUM-SIZED
ENTERPRISES TO FOSTER THE PEACEFUL USES OF CHEMISTRY
ONLINE, 29 JUNE 2021**

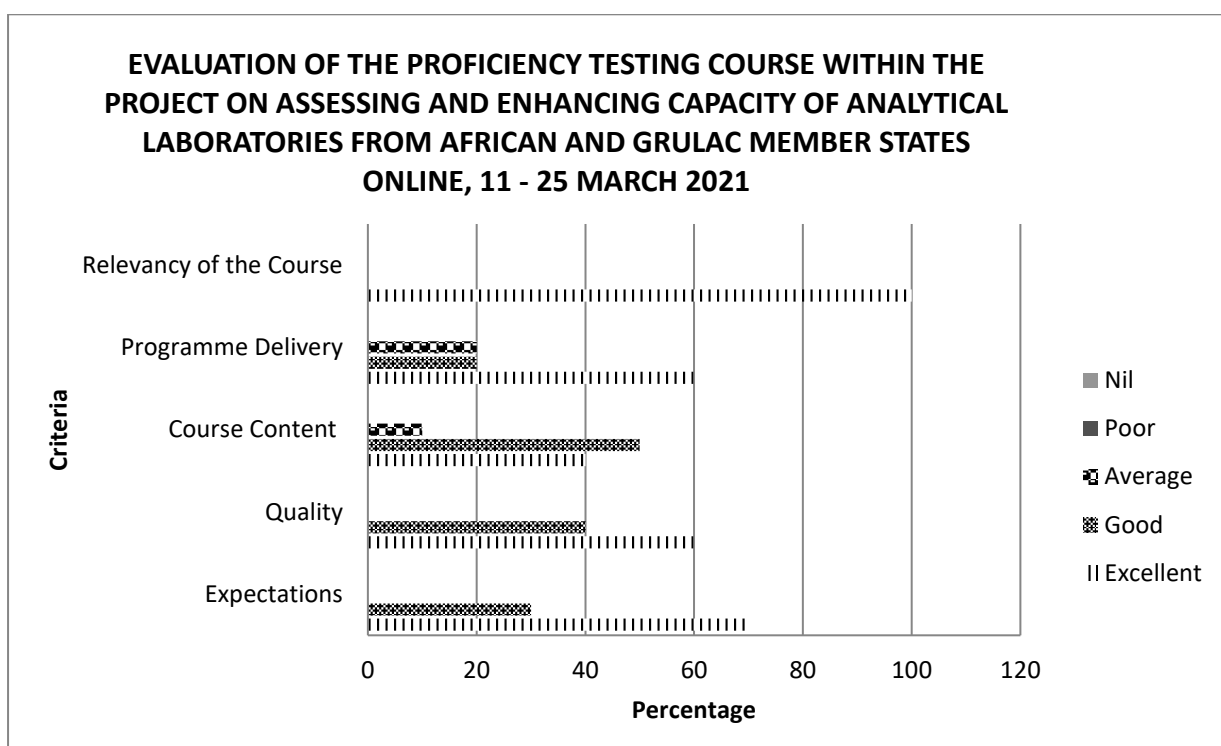
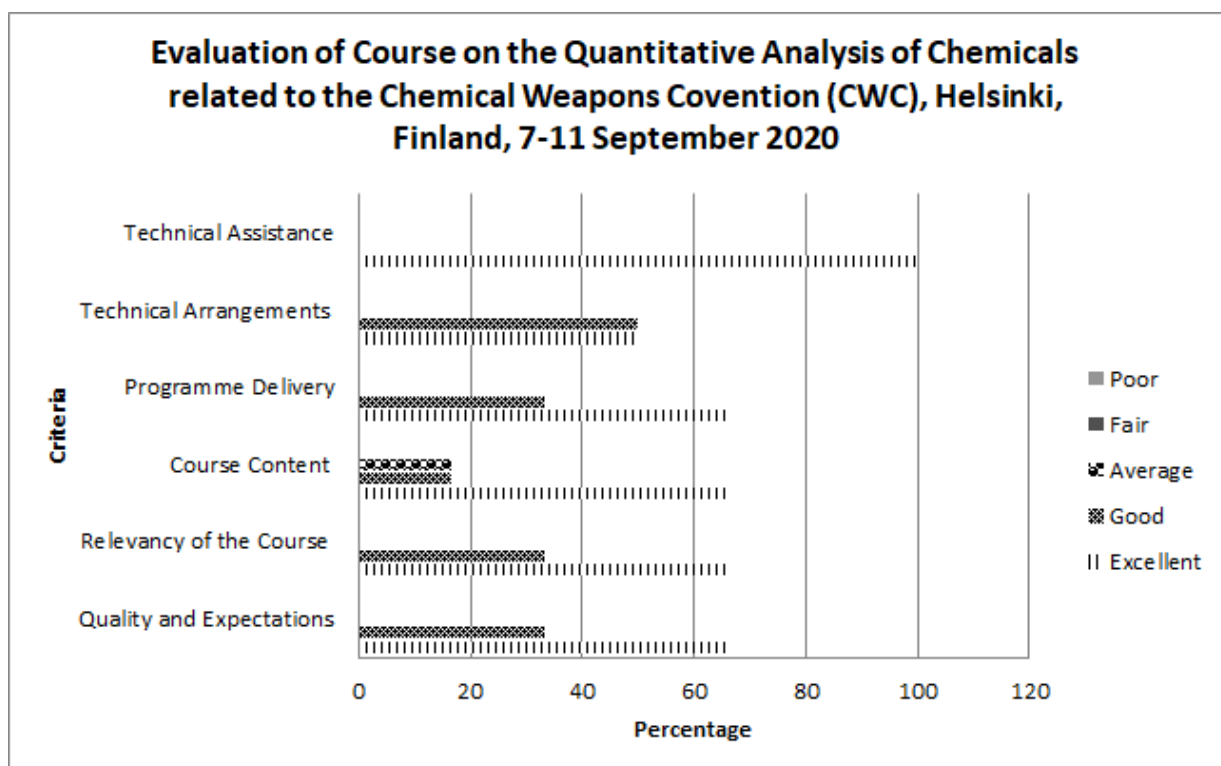


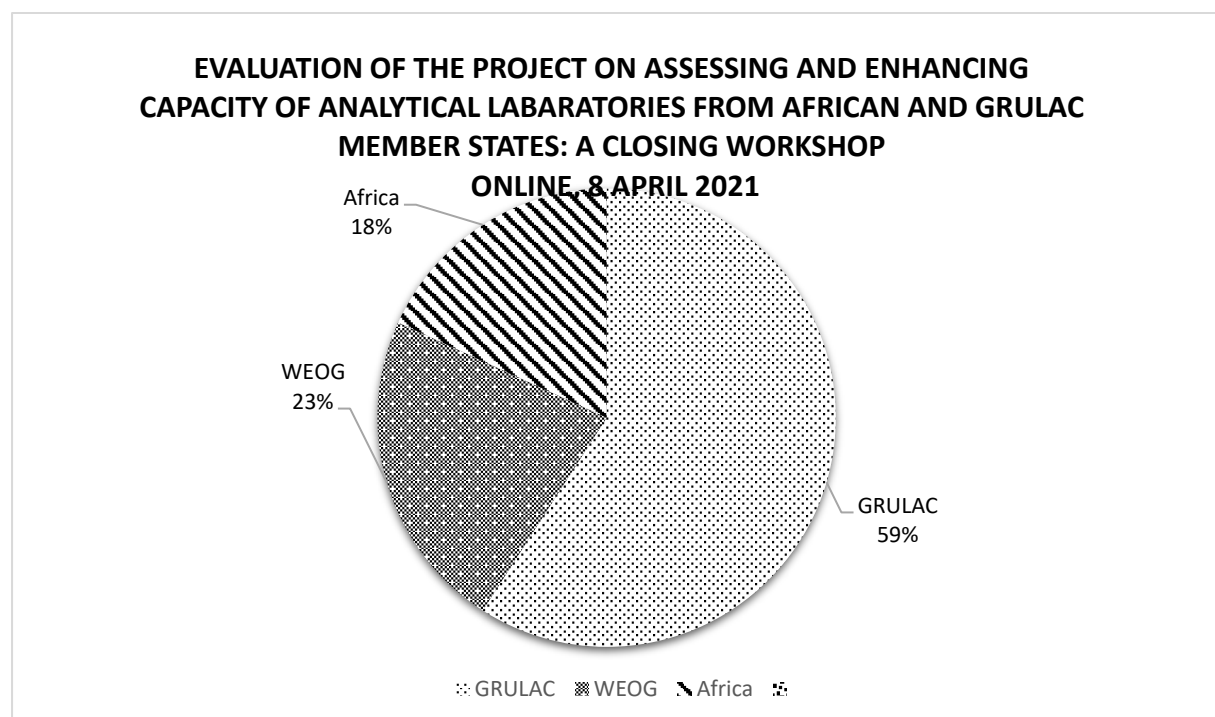
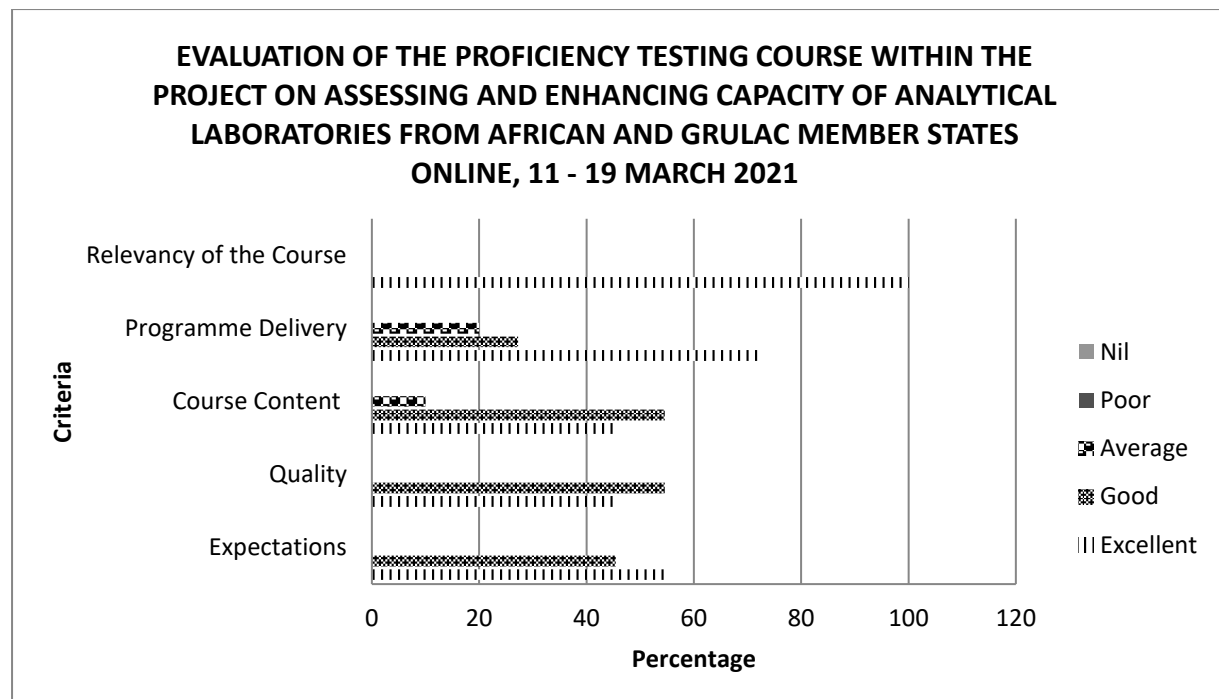
**EVALUATION OF THE ADVANCED COURSE ON CHEMICAL SAFETY AND
SECURITY MANAGEMENT FOR AFRICA
ONLINE, 2 JULY 2021**



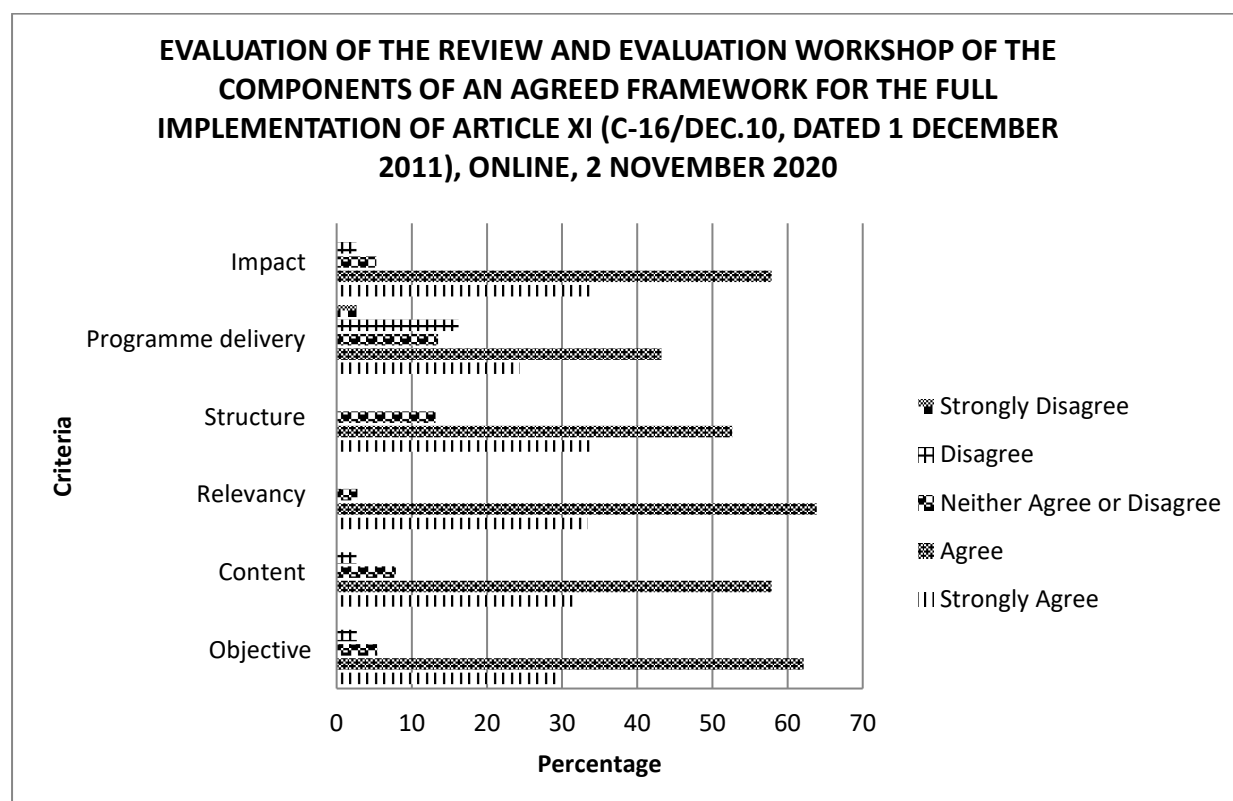
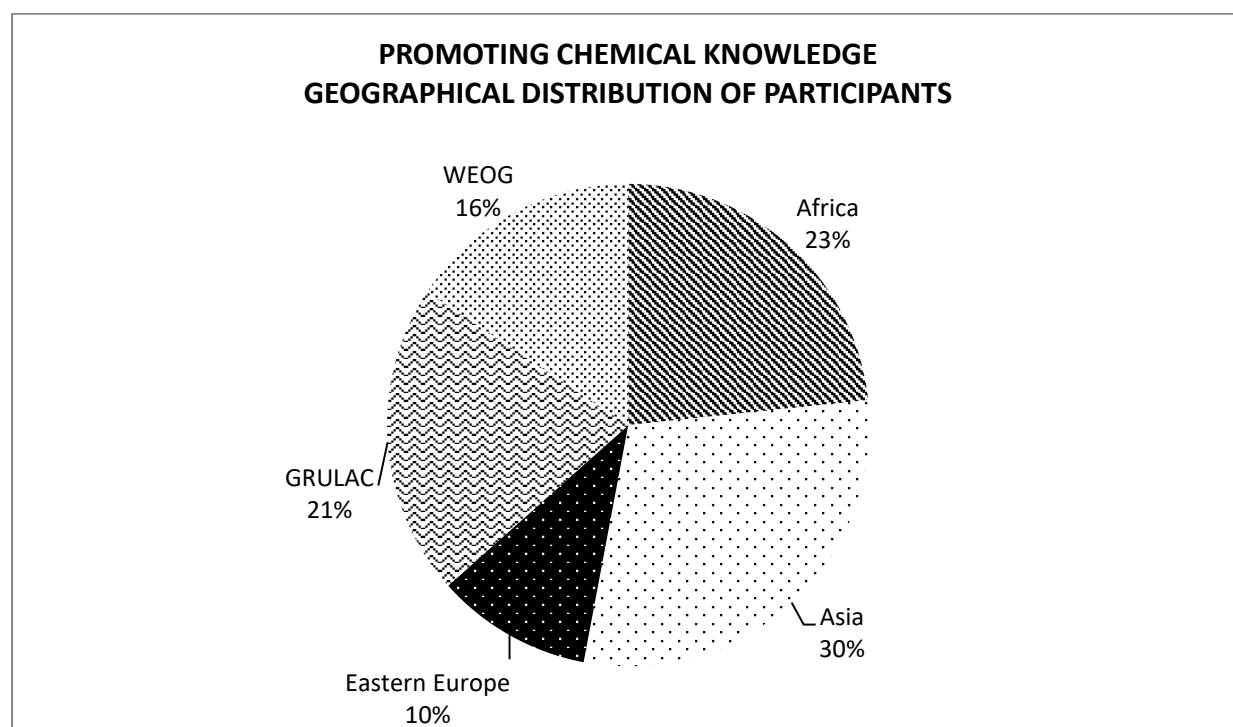


2. ENHANCEMENT OF LABORATORY CAPABILITIES

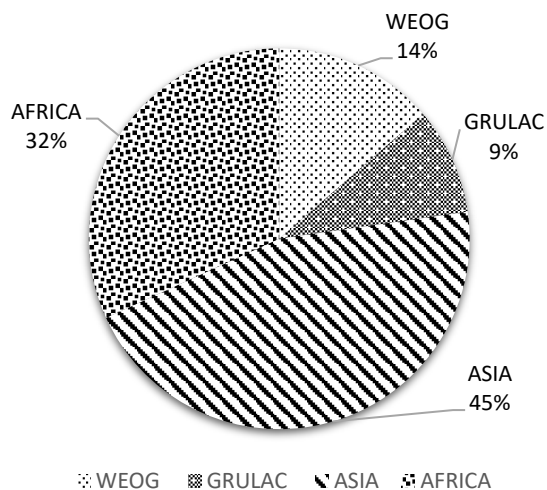




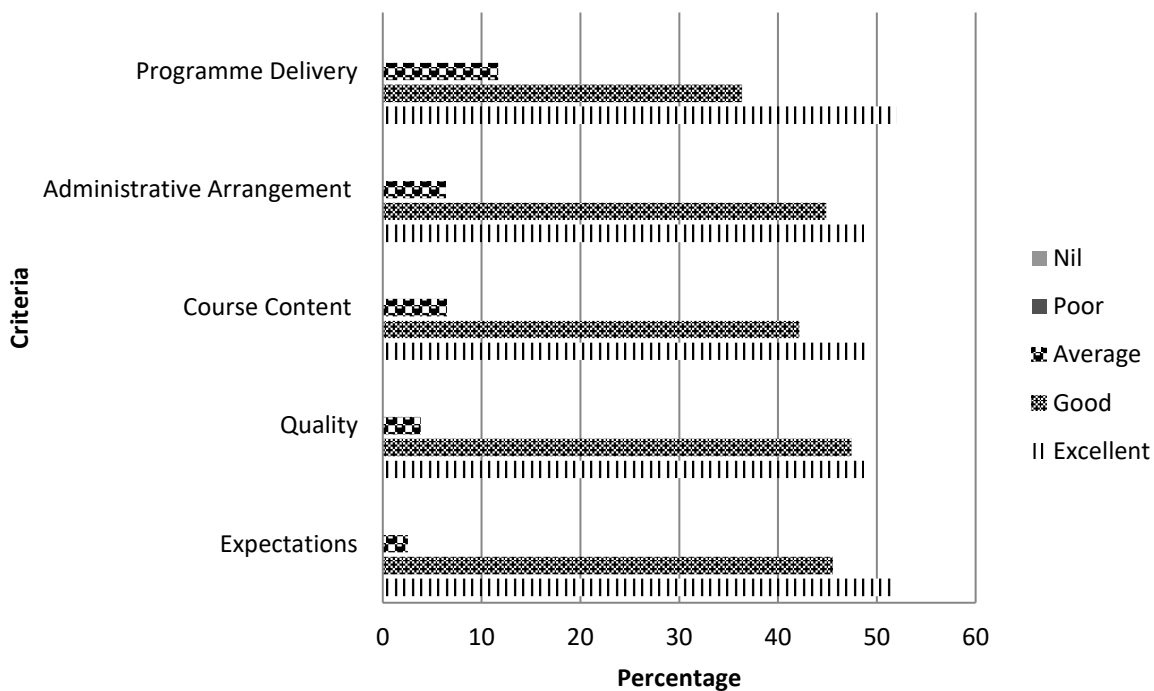
3. CHEMICAL KNOWLEDGE PROMOTION AND EXCHANGE



**EVALUATION OF THE OPCW-IFS JOINT WORKSHOP ON TOXIC
CHEMICALS IN THE ENVIRONMENT: FROM UNDERSTANDING
POLLUTION AND ITS REMOVAL AND VERIFICATION TECHNIQUES
ONLINE, 25- 26 NOVEMBER 2020**



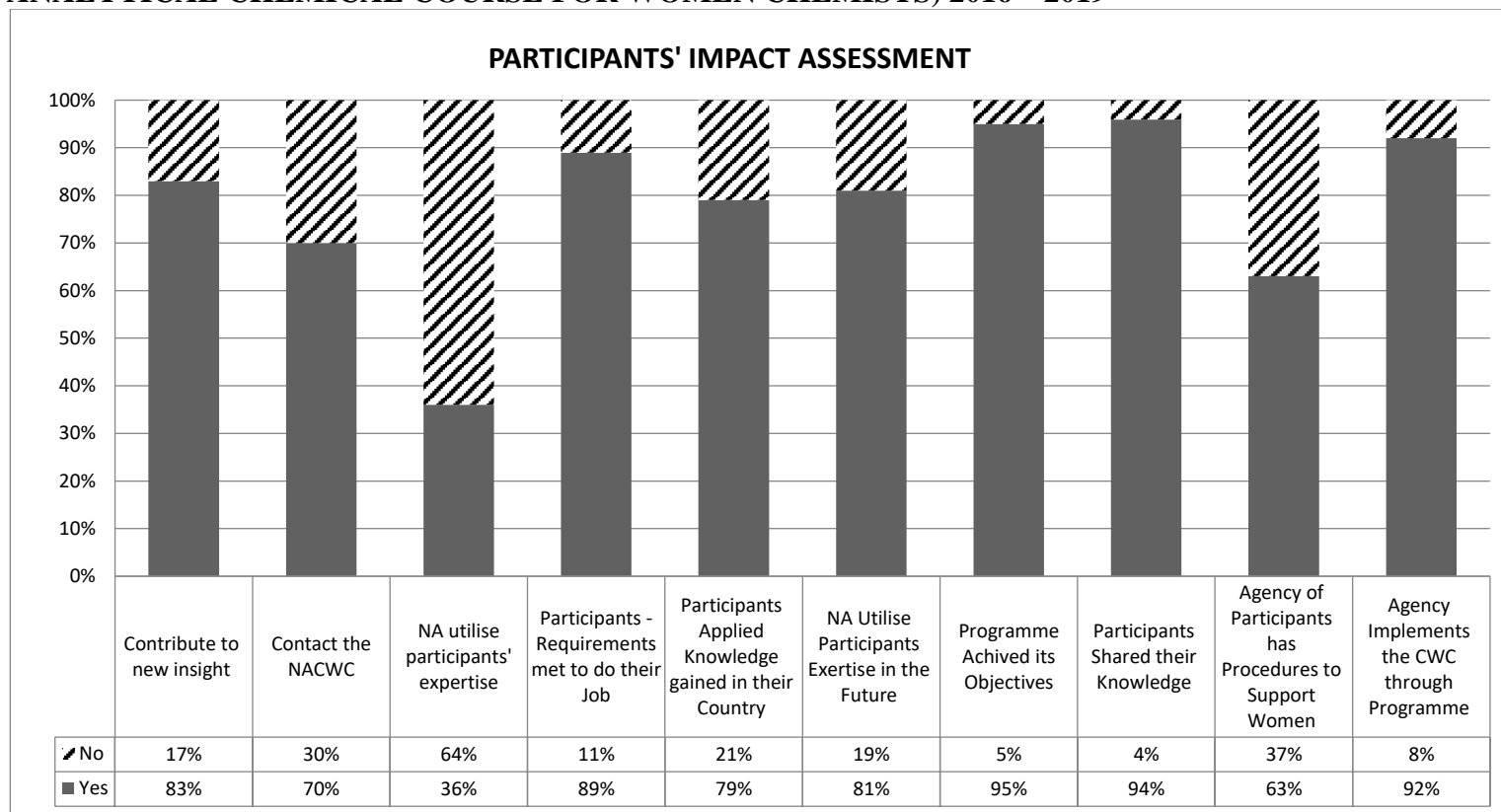
**EVALUATION OF THE SYMPOSIUM ON WOMEN IN CHEMISTRY
ONLINE, 1 JULY 2021**

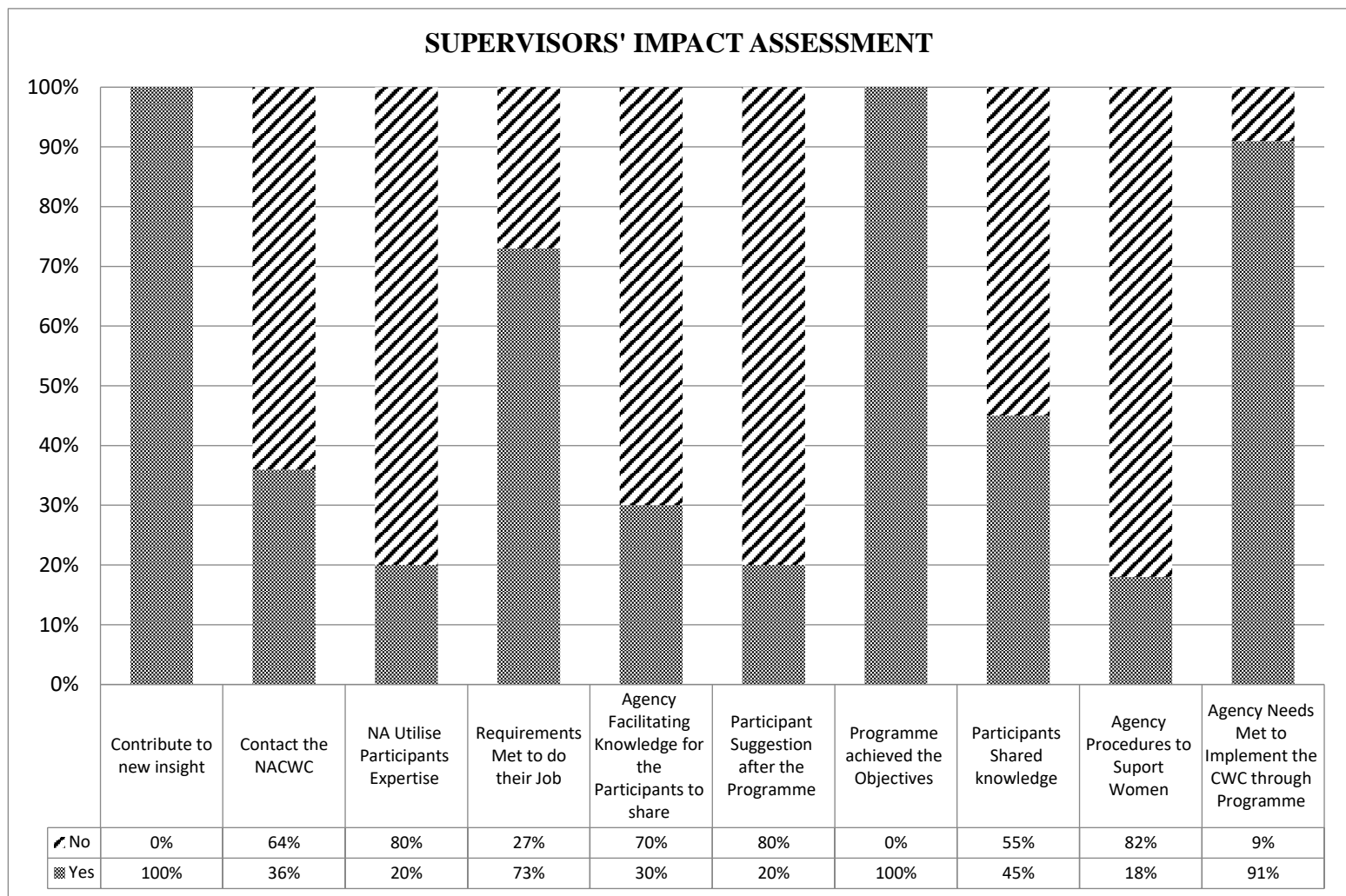


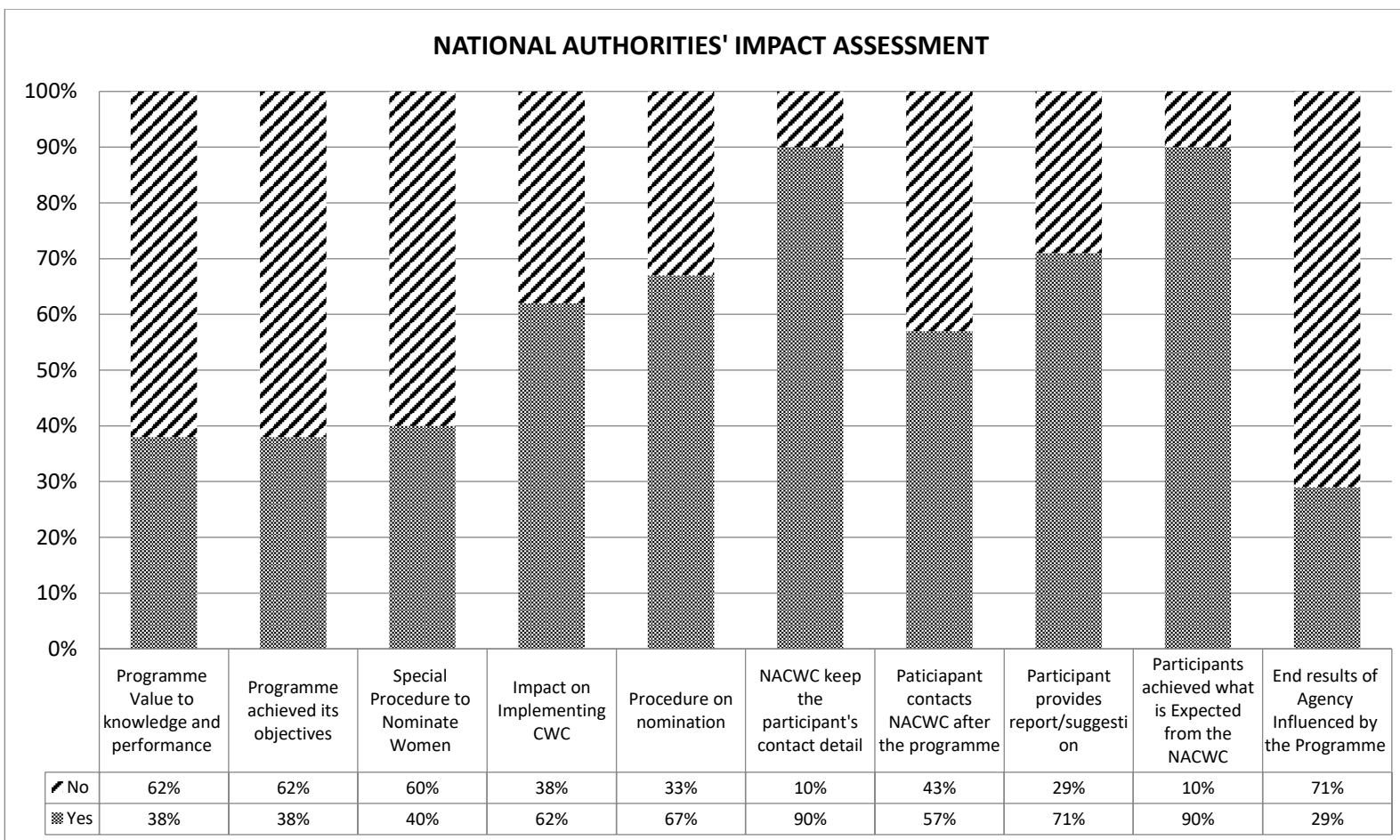
Annex 6

IMPACT ASSESSMENT OF INTERNATIONAL COOPERATION PROGRAMMES

WOMEN IN CHEMISTRY INITIATIVE (SYMPOSIUM ON WOMEN IN CHEMISTRY AND BASIC ANALYTICAL CHEMICAL COURSE FOR WOMEN CHEMISTS) 2016 – 2019







Annex 7

**SUMMARY OF MAIN ACTIVITIES UNDERTAKEN UNDER THE AUSPICES OF
THE INTERNATIONAL COOPERATION BRANCH
26 AUGUST 2020 TO 25 AUGUST 2021**

Programme/ Initiative	Date	Venue	Benefitting States Parties	Number of Participant	Total Number of Participant	Number of States Parties
Integrated Chemicals Management						
Associate Programme	21 September – 1 October 2020	Online	Argentina, Armenia, Bangladesh, Barbados, Belarus, Botswana, Brazil, Cameroon, China, Costa Rica, Cuba, Democratic Republic of the Congo, Gambia, Ghana, India, Jamaica, Kenya, Malawi, Mauritius, Namibia, Niger, Nigeria, Pakistan, Panama, Qatar, Sierra Leone, Somalia, Sri Lanka, Uganda, Ukraine, United Republic of Tanzania, Uzbekistan, Viet Nam, Zambia, Zimbabwe	36	63	35
	18 May – 1 June 2021	Online	Afghanistan, Bahrain, Cambodia, Cameroon, Chile, Colombia, Ethiopia, Iran (Islamic Republic of), Iraq, Mozambique, Nicaragua, Nigeria, Philippines, State of Palestine, Sudan, Uganda, United Republic of Tanzania, Zimbabwe	27		18
Chemical Safety and Security	7 – 30 September 2020	Online	Burkina Faso, Burundi, Cameroon, Chile, Colombia, Costa Rica, Cuba, El Salvador, Gambia, Indonesia, Iran (Islamic Republic of), Iraq, Kenya, Morocco, Namibia, Nigeria, Pakistan, Saint Vincent and the Grenadines, Saudi Arabia, Senegal, Sri Lanka, Uganda, Zimbabwe	24	509	23
	22 October 2020	Online	Barbados, Brazil, Chile, Colombia, Cuba, Ecuador, El Salvador, Grenada, Guatemala, Mexico, Nicaragua, Panama, Peru, Saint Kitts and Nevis, Uruguay	59		16
	17 November 2020	Online	Cambodia, Indonesia, Malaysia, Mongolia, Philippines, Turkmenistan, Timor Leste, Viet Nam	21		8

Programme/ Initiative	Date	Venue	Benefitting States Parties	Number of Participant	Total Number of Participant	Number of States Parties
	23 February 2021	Online	Afghanistan, Bangladesh, Bhutan, Cambodia, India, Indonesia, Germany, Malaysia, Myanmar, Pakistan, Philippines, Qatar, Spain, Sri Lanka, Viet Nam	101		15
	26 February 2021	Online	Albania, Bosnia and Herzegovina, Croatia, Germany, Italy, Montenegro, North Macedonia, Serbia, Turkey	28		9
	1 April 2021	Online	Algeria, Botswana, Burkina Faso, Germany, Kenya, Mauritius, Morocco, Mozambique, Niger, Nigeria, Uganda, Sierra Leone, Sudan	37		13
	8 – 10 June 2021	Online	Columbia, Cuba, India, Iraq, Italy, Malawi, Malaysia, Mauritius, Oman, Pakistan, Poland, Portugal, Romania, Tajikistan, Tunisia, Turkey, Uruguay	45		17
	14 – 18 June 2021	Online	Azerbaijan, Belarus, Kyrgyzstan, Tajikistan, Tunisia, Turkmenistan, Uzbekistan,	20		7
	29 June 2021	Online	Algeria, Argentina, Bangladesh, Belarus, Brazil, Cameroon, China, Costa Rica, Croatia, Cuba, Ethiopia, Germany, Ghana, Guatemala, India, Indonesia, Ireland, Italy, Madagascar, Malaysia, Maldives, Mexico, Myanmar, Nigeria, Oman, Pakistan, Philippines, Poland, Qatar, Saint Vincent and the Grenadines, Saudi Arabia, Seychelles, Spain, Togo, Turkey, United Arab Emirates, United States, Venezuela (Bolivarian Republic of), Zambia	120		39
	2 July 2021	Online	Burkina Faso, Ethiopia, Kenya, Mauritania, Mozambique, Nigeria, Seychelles, Sudan, Togo, Tunisia, Uganda, Zimbabwe	29		12
	22 July 2021	Online	Bahamas, Brazil, Colombia, Cuba, Ecuador, Nicaragua, Peru, Trinidad and Tobago, Uruguay	25		9

Programme/ Initiative	Date	Venue	Benefitting States Parties	Number of Participant	Total Number of Participant	Number of States Parties
Enhancement of Laboratory Capabilities						
Analytical skills development courses and proficiency testing training	7 – 11 September 2020	Online	Morocco, Sri Lanka, Tunisia, Uganda	4	54	4
	7 – 11 September 2020	Online	Bangladesh, Nigeria, United Republic of Tanzania	3		3
	11 – 18 March 2021	Online	Chile	12		2
	22 – 25 March 2021	Online	Brazil			
	15 – 19 March 2021	Online	Kenya, Nigeria	17		2
	8 April 2021	Online	Brazil, Chile, Finland, Germany, Kenya, Nigeria, Spain, United Kingdom	18		8
Equipment Exchange	August 2020 – August 2021	Germany	Sudan, United Republic of Tanzania	n/a	n/a	2
Chemical Knowledge Promotion and Exchange						
Article XI Workshop	2 November 2020	Online	Algeria, Albania, Argentina, Bangladesh, Barbados, Brazil, Burkina Faso, Cambodia, Canada, Chile, China, Colombia, Costa Rica, Cuba, El Salvador, Finland, France, Germany, Guatemala, India, Indonesia, Iran (Islamic Republic of), Ireland, Italy, Jamaica, Japan, Jordan, Kenya, Lebanon, Madagascar, Malaysia, Maldives, Mexico, Montenegro, Morocco, Mozambique, Nicaragua, Nigeria, Oman, Pakistan, Peru, Philippines, Qatar, Rwanda, Serbia, Slovenia, Spain, Ukraine, United States, United Kingdom, Viet Nam	90	90	51
Conference Support Programme	26 August 2020 – 25 August 2021	Online and hybrid	Italy, Mauritius	214	214	n/a
Programme for Support of Research Projects	26 August 2020 – 25 August 2021	Same as benefitting States Parties	Argentina, Benin, Brazil, Côte d'Ivoire, Indonesia, Italy, Kenya, Malaysia, Nepal, Nigeria, North Macedonia, Pakistan, Serbia, South Africa, Sri Lanka, Tunisia, Turkey, Uganda, Uruguay, Viet Nam, Zimbabwe	36	36	21
Building a Knowledge Society	25 – 27 November 2020	Online	Argentina, Cameroon, China, India, Malaysia, Mongolia, Nigeria, Pakistan, South Africa, Sri Lanka, Thailand, Tunisia, Viet Nam	20	20	13

Programme/ Initiative	Date	Venue	Benefitting States Parties	Number of Participant	Total Number of Participant	Number of States Parties
Fellowship Programme	25 June – 12 September 2021	Paris, France	Jordan	1	1	1
Women in Chemistry	1 July 2021	Online	Afghanistan, Algeria, Argentina, Australia, Azerbaijan, Bahamas, Bangladesh, Belarus, Botswana, Brazil, Burundi, Cameroon, Chile, China, Colombia, Costa Rica, Côte d'Ivoire, Croatia, El Salvador, Eritrea, Ethiopia, France, Georgia, Germany, Ghana, Guatemala, Guyana, India, Indonesia, Iraq, Ireland, Italy, Jordan, Kenya, Lebanon, Luxembourg, Malawi, Malaysia, Mali, Mexico, Morocco, Myanmar, Nicaragua, Nigeria, Pakistan, Peru, Philippines, Poland, Portugal, Romania, Saint Vincent and the Grenadines, Samoa, Serbia, Seychelles, Sierra Leone, South Africa, Thailand, Togo, Turkey, Ukraine, United States, Uruguay, Uzbekistan, Zambia	172	172	64