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



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EXECUTIVE SUMMARY

1. This report has been produced for the 101st 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 2021 to 25 August 2022.
2. During the reporting period, the Secretariat further enhanced its portfolio 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 and launched new initiatives 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, with special attention to cost-effectiveness and 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. Despite the unprecedented challenges posed by the COVID-19 pandemic, the Secretariat continued to make every effort to accommodate the needs of States Parties across all three thematic areas and to minimise, to the extent possible, the impact of the situation on the implementation of the Article XI programmes. The Secretariat continued to employ online modalities to ensure implementation of various programmes and activities.
5. During the reporting period, the Secretariat organised 25 capacity-building programmes (training activities, seminars, and workshops) with a total of 641 participants from 91 States Parties. Five events were held in in-person format. The Secretariat supported 22 research projects, 14 fellowships, and 3 conferences, of which two were held in person and one was conducted in hybrid format.
6. In the area of integrated chemicals management, during the reporting period the Secretariat initiated the twenty-third edition of the Associate Programme in face-to-face format, benefiting 30 participants from 30 States Parties. A special focus continued to be placed on chemical safety and security management, with the organisation of 10 training courses and workshops benefiting 285 participants from 57 States Parties.
7. In the area of enhancement of laboratory capabilities, the Secretariat delivered 17 analytical skills development courses, proficiency testing training courses, and laboratory training courses, benefitting 240 participants from 59 States Parties.

8. 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. Among the key highlights were the launch of the first edition of the Education and Training Programme for Youth on Peaceful Uses of Chemistry to enhance the capacities of young people in respect of peaceful uses of chemistry towards the prevention of diversion of chemicals for malicious use. The initiative, supported by the European Union, was attended by 47 participants from 18 OPCW Member States. The Secretariat also sponsored three scientific conferences in three States Parties under the Conference Support Programme, benefitting 95 experts; funded 22 research projects in 12 States Parties under the Programme for Support of Research Projects; and provided 14 fellowships for junior scientists under the Fellowship Programme.
9. To further 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 sustained. Special attention was given to the alumni networks of the programmes. In addition to the vibrant alumni network of the Associate Programme, a new alumni network was launched for the Education and Training Programme for Youth on Peaceful Uses of Chemistry. Also, alumni networks have been established for the Chemical Safety and Security Management Programme, the Integrated Chemicals Management Programme, and the Women in Chemistry initiative, which offer the Secretariat an additional channel to communicate with former participants and support their initiatives, including education and outreach on the Convention and the peaceful uses of chemistry.
10. Furthermore, the Secretariat continued to place due emphasis on strengthening capacity-building needs assessments for the effective delivery of programmes. In this context, during the reporting period, the Secretariat continued its efforts to conduct needs assessments in the area of integrated chemicals management. The Secretariat also invited States Parties, on a voluntary basis, to submit assessments on their specific needs in the area of chemical safety and security management, as well as information on existing tools, guidelines, and best practices in chemicals management in their respective countries.
11. The evaluation and impact assessment approach and techniques were further 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 Fellowship Programme, covering the last five years (2017 to 2021).
12. 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

consultation mechanism. Also, the Secretariat undertook continued 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 sustained a more proactive approach to encouraging relevant States Parties to make donations for the Equipment Exchange Programme.

INTRODUCTION

13. 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 2021 to 25 August 2022.
14. 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

15. 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 needs and priorities of the States Parties were taken into consideration throughout the continued implementation of the programmes, with resources provided from the regular budget as well as voluntary contributions, both financial and in kind.
16. 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.

17. 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

18. 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.
19. 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 Programme;
 - (iii) Executive Programme;
 - (iv) green and sustainable chemistry;
 - (v) Responsible Care[®] workshops; and
 - (vi) development of tools and guidance on chemical safety and security management.
 - (b) Enhancing laboratory capabilities:
 - (i) analytical chemistry and analytical skills development courses;
 - (ii) enhancement of laboratory skills courses;
 - (iii) proficiency testing training;
 - (iv) customs laboratory training;
 - (v) Laboratory Twinning and Assistance Programme; and
 - (vi) Equipment Exchange Programme.
 - (c) Chemical knowledge promotion and exchange:
 - (i) Fellowship Programme;
 - (ii) Programme for Support of Research Projects;
 - (iii) Conference Support Programme;
 - (iv) forum on peaceful uses of chemistry;
 - (v) Education and Training Programme for Youth on Peaceful Uses of Chemistry;
 - (vi) Women in Chemistry initiative; and
 - (vii) policy and diplomacy for scientists.

INTEGRATED CHEMICALS MANAGEMENT

20. 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

21. 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.
22. 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.
23. The Associate Programme also supports chemical safety and security in an industrial environment, with a focus on the Responsible Care[®] programme.
24. The in-person segment of the twenty-second edition of the Associate Programme was planned to take place at OPCW Headquarters from 18 October to 5 November 2021. However, due to the surge in the number of COVID-19 cases and ensuing restrictions, it was decided to carry over the segment to 2022, along with the in-person segment from the twenty-first edition, which had been scheduled to take place in 2020.
25. The twenty-third edition of the Associate Programme began on 28 July 2022 in The Hague, the Netherlands, and is due to close on 8 September 2022. The programme is hosting a total of 30 participants from its previous two editions (twenty-first and twenty-second), held online due to the challenges posed by the COVID-19 pandemic. The current in-person edition raises awareness of participants on the Convention, its history, and its implementation by Member States. The training covers a wide range of topics and has a significant focus on chemical safety and security in industry, chemical plants auditing, and emerging threats and trends. During the two-week intermittent segment at the University of Surrey in the United Kingdom of Great Britain and Northern Ireland, the participants learn about the theory of mass balance and practice at the University's model plant. Upon completion of the programme, all participants will present research projects on topics related to the Convention. Thirty participants have been admitted to the programme from the following 30 Member States: Argentina, Armenia, Belarus, Botswana, Brazil, Cambodia, Cameroon, Chile, Colombia, Cuba, the Democratic Republic of the Congo, Ethiopia, the Gambia, Ghana, India, Iraq, Kenya, Malawi, Mauritius, the Niger, Nigeria, Pakistan, the Philippines, Sierra Leone, Somalia, the State of Palestine, Uganda, the United Republic of Tanzania, Uzbekistan, and Viet Nam.

26. The Associate Programme has shown itself to be the flagship programme of the OPCW in the area of international cooperation. Each year, the programme targets young professional scientists and engineers, with a specific focus on Member States with economies that are either developing or in transition. It has been subject to regular reviews and has been expanded in duration, number of participants, and training modalities.
27. To date, twenty-three editions of the Associate Programme have taken place, with the 545 professionals from 121 States Parties who have participated now being engaged in an active alumni network. Special attention has been given to the participation of female professionals, with 160 women from 77 States Parties having 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 and security 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 often offer valuable support regarding the implementation of the Convention at the national and regional levels. It is noteworthy that, over the years, several associates have later become Secretariat staff members.
28. The Alumni Association of the Associate Programme, established in 2012 as a group on the social media platform Facebook, has continued to provide a highly interactive forum among the current and former participants to share views, scientific information, and experiences in the field of chemistry. In addition, the association has continued to serve as a reliable channel to receive feedback regarding the programme and to provide updates on the work of the OPCW. This exchange of information ensures continuous improvement of the programme for longer-term impact. The group also offers the opportunity for professional networking, as participants can get together for joint projects and help each other on various professional issues.

Chemical safety and security management

29. The chemical safety and security management-related activities that took place during the review period were 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

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

30. During the reporting period, the Secretariat organised 10 online capacity-building activities on chemical safety and security management.
31. The Secretariat organised an online Wuppertal course on explosion protection and error management in the chemical process industries from 6 September to 8 October 2021. The course focused on explosion protection and human errors in chemical process industries. The course was attended by 24 participants from varying backgrounds, including from government agencies, the chemical industry, and academia, from 21 Member States: Bangladesh, Brazil, Chile, Costa Rica, Cyprus, Ethiopia, Ghana, Grenada, India, Kenya, Malaysia, Maldives, Mauritania, Mauritius, Nigeria, Peru, the Philippines, Seychelles, South Africa, Sri Lanka, and Tunisia.
32. The Secretariat, in partnership with the University of Nottingham in Malaysia, organised an online workshop for Member States in the Asia region entitled “Chemical Supply Chain: Regional Road Transport Safety and Security Management” from 4 to 8 October 2021. The workshop focused on the land transportation of chemicals and benefited professionals from the chemical industry and government institutions. The participants gained a better understanding of and insights into risk assessment, risk mitigation measures, and performance auditing, as well as the latest research and development, including technical solutions in monitoring and control related to the chemical supply chain. Seventy-five representatives of the chemical industry and industry associations, National Authorities, government departments, research institutes, and academia from 12 Member States participated in the workshop: Bangladesh, Cambodia, China, India, Iraq, Malaysia, Myanmar, Pakistan, Qatar, Saudi Arabia, Sri Lanka, and Uzbekistan.
33. The Secretariat organised, in partnership with and with the co-sponsorship of the International Union of Pure and Applied Chemistry (IUPAC), an online e-learning chemical safety training programme in Spanish for Member States in the Latin America and the Caribbean (GRULAC) region from 4 October to 3 December 2021. The training course, delivered by the Chemical Industries Association of Uruguay, provided an update on the current standards, policies, and best practices in occupational safety, chemical hazards, handling, storage, and transport of chemicals and waste management. Participants had access to a wealth of training materials available on a dedicated e-learning platform consisting of five modules covering safety, chemicals, security, emergencies, and management and culture. Fifteen chemistry experts specialised in environmental, health, safety, and security aspects of the use of chemicals attended the course. They represented 13 Member States: Argentina, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Costa Rica, Cuba, El Salvador, Honduras, Mexico, Nicaragua, Peru, and Uruguay.

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.

34. The Secretariat organised an online training course on 29 November 2021 to mitigate chemical supply chain security vulnerabilities in Iraq. The course focused on chemical supply chain safety and security strategies to prevent the misuse of highly toxic chemicals and to minimise internal and external threats. Participants reviewed the resources, tools, and skills needed to effectively promote chemical safety and security standards. The training, organised with support from CRDF Global, was attended by 25 Iraqi participants representing the chemical industry and industry associations, the National Authority, government departments, and academia.
35. On 13 December 2021, the Secretariat organised the “Seoul Workshop on the Peaceful Development and Use of Chemistry” for Asian Member States, aimed at building awareness of States Parties regarding advanced chemical safety and security practices, dual-use chemicals and their diversion for non-peaceful purposes, and process safety management audit methods. The course was attended by 24 participants from 13 Asian Member States: Bangladesh, Cambodia, Indonesia, Iran (Islamic Republic of), Malaysia, Myanmar, Pakistan, the Philippines, Qatar, Saudi Arabia, Sri Lanka, the United Arab Emirates, and Viet Nam.
36. On 25 January 2022, the Secretariat held an online workshop to mitigate chemical supply chain security vulnerabilities in Bangladesh. The workshop provided participants from the National Authority of Bangladesh with the baseline information related to chemical supply chain security, security threat and vulnerability assessment, and risk management processes. It also covered information on chemical inventory management and showcased relevant examples of chemical security. The participants also learnt about the Online Self-Assessment Tool developed by the OPCW, which supports a comprehensive review of national protective measures in response to chemical incidents.
37. The Secretariat, from 4 to 6 April 2022, organised a workshop on developing indicative guidelines for transportation of hazardous chemicals by road in Wuppertal, Germany. The workshop hosted global experts in chemical safety and security who shared the practices of hazardous chemicals transportation in their respective countries and regions. The experts further brainstormed on ways to develop indicative guidelines to benefit the Member States and chemical industries in need. A series of workshops, meetings, and informal consultations are planned to develop the guidelines. Eleven experts from the following seven OPCW Member States participated: Brazil, Germany, Kenya, the Philippines, Sri Lanka, the United Kingdom of Great Britain and Northern Ireland, and the United States of America.
38. From 10 to 12 May 2022, the Secretariat organised a seminar on chemical safety and security management for African Member States in Harare, Zimbabwe. The seminar aimed to raise awareness of the importance of chemical safety and security policy and guidelines to prevent chemical accidents and the potential misuse of toxic chemicals. The seminar was attended by 35 participants representing 14 OPCW States Parties: Ethiopia, Kenya, Mali, Mauritania, Mauritius, the Niger, Nigeria, Seychelles, South Africa, the Sudan, Togo, Tunisia, Uganda, and Zimbabwe.

39. The Secretariat organised a seminar on chemical safety and security management for GRULAC States Parties in Lima, Peru, from 12 to 14 July 2022. The main objective of the seminar was to sensitise States Parties to chemical safety and security risks and to provide stakeholders with knowledge about modern safety strategies, chemical site security management, and process safety culture. The seminar gathered 36 participants from industry, academia, and government institutions representing 10 States Parties: Argentina, the Bahamas, Brazil, Chile, Cuba, Guatemala, Panama, Peru, Saint Kitts and Nevis, and Uruguay.
40. The Secretariat, in partnership and with the co-sponsorship of IUPAC, organised the second edition of the online safety training programme from 1 August to 7 October 2022. The e-learning course, focusing on chemical safety and conducted in Spanish for States Parties in the GRULAC region, was delivered by the Chemical Industries Association of Uruguay. It provided an update on the current standards, policies, and best practices in occupational safety, chemical hazards, handling, storage, and transport of chemicals and waste management. The content of the course included five e-learning modules: safety, chemicals, emergencies, security, and management and culture. The course was attended by 15 chemistry experts specialised in environmental, health, safety, and security aspects of the use of chemicals, representing eight Member States: Brazil, Chile, El Salvador, Guatemala, Honduras, Mexico, Panama, and Peru.

ENHANCEMENT OF LABORATORY CAPABILITIES

41. The Secretariat continued to provide capacity-building activities for participants from developing countries and countries with economies in transition to assist their efforts in building or further enhancing their laboratory capacities. The activities included a range of general analytical chemistry courses (analytical skills development courses, analytical chemistry courses, enhancement of laboratory skills courses, and a basic analytical 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 240 participants from the following 59 States Parties either benefited from or supported these activities: Algeria, Argentina, Armenia, Bangladesh, Belarus, Benin, Bolivia (Plurinational State of), Botswana, Brazil, Burkina Faso, Burundi, Cambodia, Chile, Colombia, Costa Rica, Côte d'Ivoire, Ecuador, El Salvador, Ethiopia, Finland, Germany, Ghana, Guatemala, Guinea-Bissau, Iraq, Kenya, the Lao People's Democratic Republic, Lesotho, Malawi, Malaysia, Mauritius, Mexico, Morocco, Namibia, Nepal, Nicaragua, Nigeria, Pakistan, Peru, the Philippines, Poland, Romania, Seychelles, Sierra Leone, South Africa, Spain, Sri Lanka, the Sudan, the Syrian Arab Republic, Tajikistan, Thailand, Tunisia, Türkiye, Uganda, the United Kingdom of Great Britain and Northern Ireland, the United Republic of Tanzania, Uruguay, Zambia, and Zimbabwe.
42. The analytical chemistry courses and analytical skills development courses aim at assisting qualified analytical chemists in acquiring further experience and practical skills in the analysis of chemicals related to the Convention and serve to:
 - (a) enhance States Parties' national capacity in analytical chemistry for personnel from industry, academic institutions, and government laboratories;

- (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.
43. The enhancement of laboratory skills courses focuses either on building skills in using specific techniques, such as mass spectrometry (MS) 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), MS, NMR, or a combination of the techniques. Participants are introduced to the preparation of samples by means of demonstrations and practical exercises. The courses also address theoretical aspects of LC and GC, LC-MS, MS, and NMR, as well as those of quantitative MS, quality assurance, and instrument maintenance.

Laboratory Twinning and Assistance Programme

44. In addition to the established training programmes in the area of enhancing laboratory capabilities, the Secretariat has continued the Laboratory Twinning and Assistance Programme (a merger of the former Laboratory Twinning initiative and Laboratory Assistance Programme), co-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.
45. The Secretariat received a number of new expressions of interest for participation in the Laboratory Twinning and Assistance Programme from the following laboratories: the Lawrence Livermore National Laboratory, Forensic Science Centre, Livermore (LLNL), the United States of America; the Institute of National Analytical Research and Services, Bangladesh; the Philippine Institute of Pure and Applied Chemistry, Ateneo de Manila University, Loyola Heights Campus, the Philippines; and the Chemical Laboratory of Multi-Element Analyses, Wrocław University of Science and Technology, Poland. The Secretariat made a comprehensive evaluation of the applications received, conducted initial discussions with applicants, and initiated the process of identification of potential twinning partners for these laboratories or consolidation of the twinning schemes, where feasible. This work has led to the commencement of the preparation for initiation of a new twinning project between the LLNL (as assisting laboratory) and the National Forensic Laboratory of Morocco (as assisted laboratory).
46. A twinning project between the Finnish Institute for Verification of the Chemical Weapons Convention (VERIFIN) (as assisting laboratory) and the Laboratory for Instrumental Analysis, Institute of Chemistry, Technology and Metallurgy, University of Belgrade, Serbia (as assisted laboratory) was initiated in the fourth quarter of 2021 after the signature of a memorandum of understanding between the Secretariat and each laboratory. Within the reporting period, two training activities took place under this project: an online training course in 2021 and an on-site training course at VERIFIN in 2022.

47. Activities are also ongoing within the 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). The memoranda of understanding between the Secretariat and the two laboratories are under revision. Within this preparatory period, a series of online evaluation meetings and three on-site training activities for the staff of the Algerian laboratory have already been organised with advanced funding from the German counterpart.

Assessing and enhancing the capacity of analytical laboratories from Member States in the Africa and GRULAC regions

48. The Project on Assessing and Enhancing Capacity of Analytical Laboratories from African and GRULAC Member States, initiated in 2019 and funded through a voluntary contribution from the Government of the United Kingdom of Great Britain and Northern Ireland, continued to advance during the reporting period. The second phase of the project, which concluded in March 2021, resulted in the partial achievement of the project's main goal of acquisition of OPCW designation by laboratories in the Africa and GRULAC regions. The laboratory of the Brazilian Army Technological Center formally obtained the designation in September 2021. The third phase of the project (2021–2022) continued to support participating laboratories.
49. Under the third phase of the project, the Secretariat organised a series of online proficiency testing seminars from 13 to 17 December 2021. The seminars targeted four laboratories (one from Brazil and three from Chile) that aspire to pass the stringent proficiency tests and covered various topics in connection with the analysis of Convention-related chemicals, including microsynthesis, analytical techniques, quality systems, and various theoretical and practical aspects of OPCW proficiency testing. Fourteen chemistry experts attended the e-seminars.
50. From 21 January to 23 March 2022, a comprehensive online training programme was organised, consisting of three separate events, to enhance the analytical capacities of laboratories of OPCW Member States in Africa. The first event of the programme was a bilateral proficiency testing training course, for which the assisting laboratory from Finland provided samples for analysis by each assisted laboratory (21 January to 14 February). For the second event, the African laboratories received a series of individualised coaching workshops (16 February to 22 March). The third event comprised joint mentorship sessions to facilitate the exchange of experiences (22 and 23 March). The programme was attended by a total of 34 participants from laboratories in Kenya and Nigeria.
51. The OPCW proficiency testing training course organised from 7 to 18 March 2022 combined theory and exercises and covered elements related to participation in OPCW proficiency testing, such as sample treatment, analytical techniques, microsynthesis, test criteria, and reporting. The course accommodated 14 participants from Brazil and Chile.

² CBRN = chemical, biological, radiological, and nuclear.

52. On 7 April 2022, the Secretariat organised an online closing workshop for the 2021–2022 phase of the project. The workshop summarised the progress achieved in the project and brought participants together to discuss the way forward in possible continuation of the project in 2022–2023 (subject to the continued support of the United Kingdom of Great Britain and Northern Ireland). The workshop was attended by 28 participants from eight OPCW Member States: Brazil, Chile, Finland, Germany, Kenya, Nigeria, Spain, and the United Kingdom of Great Britain and Northern Ireland.

Analytical skills development courses and proficiency testing training

53. During the reporting period, nine analytical chemistry courses, analytical skills development courses, and proficiency testing training courses were organised for the benefit of 240 participants from 59 States Parties. These included: three parallel courses for women chemists, experts from facilities supporting customs services, and professionals from laboratories interested in participating in OPCW proficiency testing; and six analytical chemistry and analytical skills development courses for Member States worldwide, as well as for Member States from the Africa, Asia, and GRULAC regions. Additionally, two specialised enhancement of laboratory skills training courses (laboratory quality management (LQM) and LC-MS) were held. These events were organised in collaboration with VERIFIN in Finland, CSIR-IICT³ in India, Protechnik Laboratories in South Africa, LAVEMA⁴ in Spain, and at the OPCW Laboratory.
54. Two specialised online training courses (one on LC-MS and one on LQM) were held by VERIFIN from 23 to 27 August 2021. The courses provided an overview of the OPCW and the Convention, including its verification provisions. They 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 nine participants from eight Member States: Cameroon, Iraq, Kenya, Malaysia, Namibia, Nigeria, Pakistan, and Tajikistan.
55. The Secretariat organised three parallel laboratory analytical chemistry courses from 4 to 15 October 2021. The training benefited three groups of laboratory professionals in the field of chemistry: women chemists, experts from facilities supporting customs services, and professionals from laboratories interested in participation in OPCW proficiency testing. The courses offered an introduction to the OPCW and the Convention and provided in-depth information on sample preparation procedures, chemical structure and properties of scheduled chemicals, and the use of analytical techniques for chemicals relevant to the Convention. The use of the OPCW Central Analytical Database for compound identification was also discussed. Forty-four chemists from laboratories of the following 26 Member States attended the courses: Armenia, Bangladesh, Belarus, Botswana, Cambodia, Chile, Côte d'Ivoire, El Salvador, Ghana, Iraq, Kenya, the Lao People's Democratic Republic, Mauritius, Morocco, Nepal, Nicaragua, Nigeria, Pakistan, Peru, the Philippines, Poland, Romania, Tunisia, Türkiye, Uganda, and Zimbabwe.

³ CSIR-IICT = Indian Institute of Chemical Technology.

⁴ LAVEMA = Laboratorio de Verificación de Armas Químicas.

56. The Secretariat organised an online analytical chemistry course in Spanish for Member States from the GRULAC region from 22 November to 3 December 2021. The aim of the training was to sensitise and enhance skills in analysing chemicals related to the Convention. Participants were updated on the scheduled chemicals under the Convention, sample preparation techniques, and the theoretical aspects of GC, GC-MS, and high-performance liquid chromatography (HPLC). They were also informed about the maintenance of laboratory equipment, quality assurance systems in chemical analysis, and opportunities for chemists under OPCW capacity-building programmes. Fifteen chemical experts from laboratories in 11 Member States participated in the course: Argentina, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Costa Rica, Ecuador, Guatemala, Mexico, Peru, and Uruguay.
57. The Secretariat organised an online analytical chemistry course for African Member States from 23 to 25 November 2021, to enhance the laboratory skills of participants from African States Parties in the analysis of Convention-related substances by using GC-MS. Seventeen analytical chemists from 17 OPCW Member States participated in the course: Algeria, Benin, Botswana, Cameroon, Côte d'Ivoire, Ghana, Guinea-Bissau, Kenya, Lesotho, Malawi, Sierra Leone, the Sudan, Tunisia, Uganda, the United Republic of Tanzania, Zambia, and Zimbabwe.
58. From 23 May to 3 June 2022, the Secretariat organised the twelfth edition of the analytical chemistry course under the OPCW Programme to Strengthen Cooperation with Africa on the Chemical Weapons Convention ("the Africa Programme"). The two-week long course, jointly implemented in partnership with Protechnik Laboratories of South Africa, aimed at developing the analytical chemistry skills of the participants and showcased the cooperation among the African Member States. The 22 participants came from the following 16 African Member States: Algeria, Benin, Botswana, Burundi, Cameroon, Côte d'Ivoire, Ethiopia, Kenya, Lesotho, Malawi, Sierra Leone, South Africa, Tunisia, Uganda, the United Republic of Tanzania, and Zimbabwe.
59. The Secretariat organised two online analytical skills development courses, one provided by CSIR-IICT from 25 to 29 April 2022 and attended by 19 participants from 18 OPCW States Parties; and one from 30 May to 10 June 2022 delivered by VERIFIN, Finland, with the financial support of the European Union. Altogether 14 participants from 11 Member States participated: Burundi, Cameroon, Ghana, Kenya, Malawi, Mali, Mauritius, Nigeria, Togo, Uganda, and Zimbabwe.
60. Lastly, from 17 to 19 May 2022, the Secretariat organised a basic analytical chemistry course for women at the OPCW Laboratory, with the financial support of the European Union. The aim of the training was to assist qualified female analytical chemists from Member States with economies that are either developing or in transition in acquiring further knowledge and experience in the analysis of chemicals under the Convention regime. The training was attended by 10 female chemists representing 10 Member States: Botswana, El Salvador, Ghana, Iraq, the Lao People's Democratic Republic, Nicaragua, Pakistan, Poland, Romania, and Zimbabwe.

Equipment Exchange Programme

61. 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 one equipment transfer and donation from Germany to the United Republic of Tanzania. 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

62. The Secretariat continued to promote and advance networking and exchange among the scientific community, academic institutions, chemical industry associations, NGOs, and regional and international institutions through standing programmes, such as the Conference Support Programme, the Fellowship Programme, the Programme for Support of Research Projects, and a 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, knowledge, and insights.

Fellowship Programme

63. The Fellowship Programme assists scientists and engineers from States Parties with economies that are either 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.
64. Fourteen fellowships were sponsored during the reporting period. In addition, a number of fellowships are scheduled to start later in 2022. Details of the fellowships can be found in Annex 2.

Programme for Support of Research Projects

65. Under the Programme for Support of Research Projects, support is extended to small-scale research projects in States Parties 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 International Foundation for Science to co-fund projects from developing countries.
66. During the reporting period, the Secretariat continued to support 22 research projects undertaken by nationals of Argentina (3), Brazil, Italy (2), Kenya, Malaysia (6), North Macedonia, Pakistan, Poland, Serbia (3), South Africa, Türkiye, and Uruguay, all of which were ongoing as at the cut-off date for this report. Details regarding the aforementioned projects are provided in Annex 3.

Conference Support Programme

67. 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.
68. During the period under review, three events were supported 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.

Empowering youth to advance peaceful uses of chemistry

69. On 7 April 2022, the Secretariat organised an online educational programme to raise awareness about the Convention among the next generation of professionals in the fields of science and chemistry, supported by the European Union. The programme aimed at upholding the global norm against chemical weapons by highlighting and explaining the role of chemical safety and security management in ensuring the peaceful use of chemicals. It provided an opportunity for young professionals to liaise, network, and build professional relationships for their future careers in chemistry and disarmament. Forty-seven participants from the following 18 OPCW Member States, representing all regional groups, participated in the event: Bangladesh, Brazil, China, Guatemala, Honduras, India, Kenya, Malaysia, Maldives, Mauritius, Morocco, Nepal, Romania, Serbia, Sri Lanka, Togo, Trinidad and Tobago, and the United Kingdom of Great Britain and Northern Ireland.

Empowering women in chemistry

70. 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 OPCW Women in Chemistry initiative was designed as an annual event that promotes the role of female chemistry professionals in advancing the peaceful uses of chemistry.
71. In the framework of the OPCW Women in Chemistry initiative, the Secretariat, together with the United Nations Interregional Crime and Justice Research Institute, initiated an action-oriented research partnership to identify best practices in recruiting, training, and promoting women in chemical safety and security. Findings from the research will be analysed and presented in a compendium that contains practical recommendations.

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

72. The Secretariat continued 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 sixth edition of the review and evaluation workshop on the components of an agreed framework for the full implementation of Article XI via an online platform on 10 November 2021. Seventy-nine participants from 48 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

73. As mandated by the Third Review Conference⁵ (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 International Council of Chemical Associations 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 most recent annual Note by the Director-General on engaging the chemical industry associations (C-26/DG.15, dated 5 November 2021).

ENHANCING THE EFFECTIVENESS OF OPCW INTERNATIONAL COOPERATION PROGRAMMES

74. During the reporting period, the process of further formalising and strengthening the alumni networks of the programmes conducted by the Secretariat under Article XI continued to gain momentum. These networks help facilitate a professional channel of interaction with and among alumni of the various programmes for the sharing of experiences and best practices in terms of the objectives of the programmes during the post-implementation phase.
75. During the reporting period, the Secretariat launched the seventh 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. This year, the survey has been revised to particularly reflect the needs related to the transportation of hazardous chemicals, while promoting wider outreach to States Parties. Thus far, the following four States Parties have provided their input: China, Germany, Panama, and the United Kingdom of Great Britain and Northern Ireland. Considering the further need to receive input on newly added areas of transportation, the survey will remain open until the end of 2022.

⁵

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

76. The Secretariat continued to support the co-facilitators for Article XI issues, Mr Junaid Sadiq, First Secretary of the Permanent Representation of the Islamic Republic of Pakistan to the OPCW, and Ms Fadhilah Halimatus Shifa Kusumaningrum, First Secretary of the Permanent Representation of Malaysia to the OPCW. The support consisted of organising 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, as well as coordinating the work of an ad-hoc drafting committee mandated to streamline the list of ideas that had emerged from the review and evaluation workshops and other relevant intersessional meetings.
77. The Council at its Ninety-Eighth Session welcomed the appointment of Ms Kusumaningrum as the sole facilitator for the full implementation of Article XI (paragraph 4.4 of EC-98/5, dated 7 October 2021). Ms Kusumaningrum, with the support of the Secretariat, also facilitated, inter alia, the conclusion of the work of the aforementioned drafting committee.
78. On 18 February 2022, the Council at its Ninety-Ninth Session welcomed the appointment of the new facilitator for Article XI issues, Ms Fatima Hamdia Tanweer, First Secretary of the Permanent Representation of the Islamic Republic of Pakistan to the OPCW (paragraph 5.2 of EC-99/2, dated 10 March 2022).
79. The Secretariat sustained its efforts to strengthen the evaluation systems and tools that allow for continual review and improvement of its programmes to further enhance the design, delivery, and effectiveness of the OPCW's international cooperation programmes and activities. 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 Annexes 4 and 5.
80. The Associate Programme serves as the flagship programme of the OPCW and consists of five distinct components, each of which is evaluated by both participants and tutors and, for the university segment, by university professors and lecturers. All components of the programme are comprehensively and fully assessed as part of a 360-degree evaluation mechanism. Based on the feedback received, the programme curriculum and delivery are continually enhanced.
81. With regard to the Programme for Support of Research Projects, research proposals are assessed and evaluated by a review committee that is composed of a number of experts representing different Secretariat units, including two members of the Scientific Advisory Board. The criteria used to assess new project proposals and the final reports of completed projects include an examination of their scientific quality, level of achievement of the stated objectives, financial planning, performance, and—for the proposals—managerial and logistic feasibility and relevance to the Convention.
82. For the Fellowship Programme, a continuous evaluation is undertaken by the Secretariat both at the proposal stage and on conclusion of the fellowship. In addition to the final scientific report on the fellowship, evaluation reports are also received from the fellowship supervisor at the host institution.

83. Analytical skills development courses are evaluated through test exercises, including both theoretical and practical assignments, during and/or 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 for participants.
84. With regard to the Chemical Safety and Security Management Programme, feedback is routinely requested at the end of workshops or training events and then discussed in order to improve the delivery of future activities.
85. With reference to the evaluation of the impact of international cooperation programmes, the Secretariat, through a structured online survey questionnaire, conducted an impact review of the Fellowship Programme, covering the period from 2017 to 2022. All former fellows, supervisors, and respective National Authorities during the said period were invited and encouraged to participate through an online survey. A total of 63% of all former fellows (22 out of 35 fellows), 54% of all former supervisors (14 out of 26 supervisors), and 61% of all National Authorities concerned (11 out of 18 National Authorities) participated in and responded to the survey. Annex 5 provides an overview of the feedback received on the overall impact of the Fellowship Programme. The feedback is particularly insightful for the Secretariat as it helps to better identify the programme's key strengths, specific areas that need further attention, and actionable recommendations that can further help to fully optimise the programme in the future.
86. The responses received from the participants through the questionnaire highlighted an overall positive impact of the Fellowship Programme vis-à-vis both their professional career and their respective institutions. Participants reported benefiting from enhanced professional opportunities following their participation in the programme, such as greater access to research grants and scholarships, and participation in conferences and events. They also acknowledged that there were more opportunities for sharing knowledge and experiences with others, as well as for mentoring initiatives. Fellows reported on new publications, including research papers in peer-reviewed journals and other articles, manuscripts, and books. Furthermore, the survey highlighted how the professional capacities strengthened through the Fellowship Programme led to the development of more up-to-date analytical procedures to better support participants' work and improve their chances of promotion and/or of receiving a special recognition or award. Most of the fellows reported positively utilising the knowledge and experience gained in their professional sphere while noting the challenges faced, particularly relating to access to equipment and financial support.
87. The supervisors also assessed the impact of the Fellowship Programme on the participants. The survey findings showed that all responding supervisors felt that the programme contributed positively towards enhancing fellows' knowledge and skills and advancing newer insights on peaceful uses of chemistry. They unanimously assessed that the programme met its stipulated objectives and concurred with the overall criteria employed by the Secretariat for the selection of fellows. Supervisors also acknowledged that the programme contributed positively to the work of their respective institutions, agencies, or organisations. Some of the recommendations for further strengthening the programme, included setting up a fellows' alumni network to improve

networking opportunities and exploring additional funding opportunities, where needed or possible, to cover costs related to research, instrumentation, and publication.

88. National Authorities, on their part, also positively reviewed the impact of the Fellowship Programme at the national level. All responding National Authorities felt that the programme met its stipulated objectives and facilitated the fellows' career development and their making a significant contribution towards advancing the implementation of the Convention in their respective countries. Some National Authorities acknowledged former fellows' providing aid and interacting with them and recommended further establishing and/or strengthening approaches or mechanisms, as needed, to maintain a liaison with former fellows and to foster greater engagement with graduating fellows.
89. Overall, the feedback on the Fellowship Programme has been positive, including vis-à-vis its overall formulation, planning, and implementation. The programme has undoubtedly contributed towards strengthening the national capacities of participating States Parties with a view to the fuller implementation of the Convention. In particular, it has helped to create a conducive platform for cooperation and mutual understanding between relevant stakeholders in the States Parties.

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

90. Throughout the reporting period, the Secretariat continued to support the facilitator for 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.
91. 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

92. 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

93. 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 for the Conference to consider and take appropriate measures, if necessary, to further promote its full implementation.
94. During the 100th Session of the Council (5 to 7 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 2021 TO 25 AUGUST 2022

No.	Conference Title	Location	Duration	State Party of Sponsored Participants	Number of Sponsored Participants
1	International Conference on Applied Chemistry and Biotechnology (ICACB-2022)	Amman, Jordan	10 – 12 May 2022	Germany, Greece, India (2), Malaysia, Netherlands, Pakistan (4), Syrian Arab Republic	11
2	56th Course of the International School of Crystallography “Crystallography under extreme conditions: The future is bright and very compressed”	Erice, Italy	4 – 10 June 2022	Brazil, Morocco (3), Russian Federation, and South Africa	6
3	Green Chemistry Postgraduate Summer School 2022 (online and in-person event)	Venice, Italy	3 – 8 July 2022	Brazil, France, India, Mexico, Morocco, Nigeria, Romania, South Africa, Switzerland, United States of America, Uzbekistan	60 online and 18 in-person participants

Annex 2

**PROJECTS CONDUCTED UNDER THE FELLOWSHIP PROGRAMME
26 AUGUST 2021 TO 25 AUGUST 2022**

No.	Title of Project	Location of Fellowship	Duration	State Party of Fellow
1	Fellowship: “The feasibility of producing microbial lipids from pyrolytic lignins and humans”	Engineering & Technology Institute, University of Groningen, the Netherlands	15 October 2021 – 14 January 2022	Argentina
2	Fellowship: “Chemical study of antimicrobial and anti-malarial assay of both the extract and isolated compounds of Cola Lepiditota (Malvaceae) follows the formulation of phytodrug and OSAR study of the isolated compounds then semi-synthesis on the lead compounds”	University of Bielefeld, Germany	15 October 2021 – 14 January 2022	Cameroon
3	Fellowship: “Evaluation of effects and molecular mechanism of five new diterpenoids isolated from Croton oligandrus Pierre ex Hutch (Euphorbiaceae) on human prostate cancer cell lines”	University Hospital Schleswig, Germany	1 August – 30 October 2022	Cameroon
4	Fellowship: “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”	University of Rome Tor Vergata, Italy	1 September 2021 – 28 February 2022	Cuba
5	Fellowship: “Biochemical characterization of new low molecular weight compounds as Neutral Aminopeptidase (APN), a relevant target for cancer chemotherapy) inhibitors: effects on APN+ melanoma and lung tumour cells”	Instituto de Biología de la UNAM, National Autonomous University of Mexico, Mexico	23 February – 25 April 2022	Cuba

No.	Title of Project	Location of Fellowship	Duration	State Party of Fellow
6	Fellowship: "Development of a new green technique for separating complex mixtures of pharmaceutical residues using supercritical fluid chromatography"	École Supérieure de Physique et de Chimie Analytique de la Ville de Paris (ESPC), France	25 June – 12 September 2021	Jordan
7	Fellowship: "Development of an electrochemical sensor for tuberculosis biomarker"	University of Western Cape, South Africa	15 October 2021 – 14 January 2022	Nigeria
8	Fellowship: "Quantitative structure activity relationship and risk analysis of selected organochlorine and organophosphorus pesticides in cow milk obtained from nomadic herders in northern Nigeria"	University of Nebraska, United States of America	17 January – 16 April 2022	Nigeria
9	Fellowship: "Synthesis and characterisation of metal organic frameworks for environmental clean-up of greenhouse gases"	Universidad Nacional de la Plata, Argentina	Pending new dates due to visa issues	Nigeria
10	Fellowship: NMR specialist	VERIFIN, Finland	1 November 2021 – 30 April 2022	Serbia
11	Fellowship: "Phytochemistry, Antitubercular activity and Cytotoxicity of selected plant species used for the treatment of tuberculosis in Uganda"	University of Potsdam, Germany	1 November 2021 – 31 January 2022	Uganda
12	Fellowship: MS chemist	VERIFIN, Finland	1 November 2021 – 30 April 2022	Uganda
13	Fellowship: on "Characterisation of the bioactive compounds from the leaves of <i>Gouania Longispicata</i> "	Walter Silulu University, South Africa	1 February – 30 April 2022	Uganda
14	Fellowship: organic skills development	Spiez Laboratory, Switzerland	30 August – 26 November 2021	Zimbabwe

Annex 3

RESEARCH PROJECTS FUNDED BY THE OPCW
26 AUGUST 2021 TO 25 AUGUST 2022

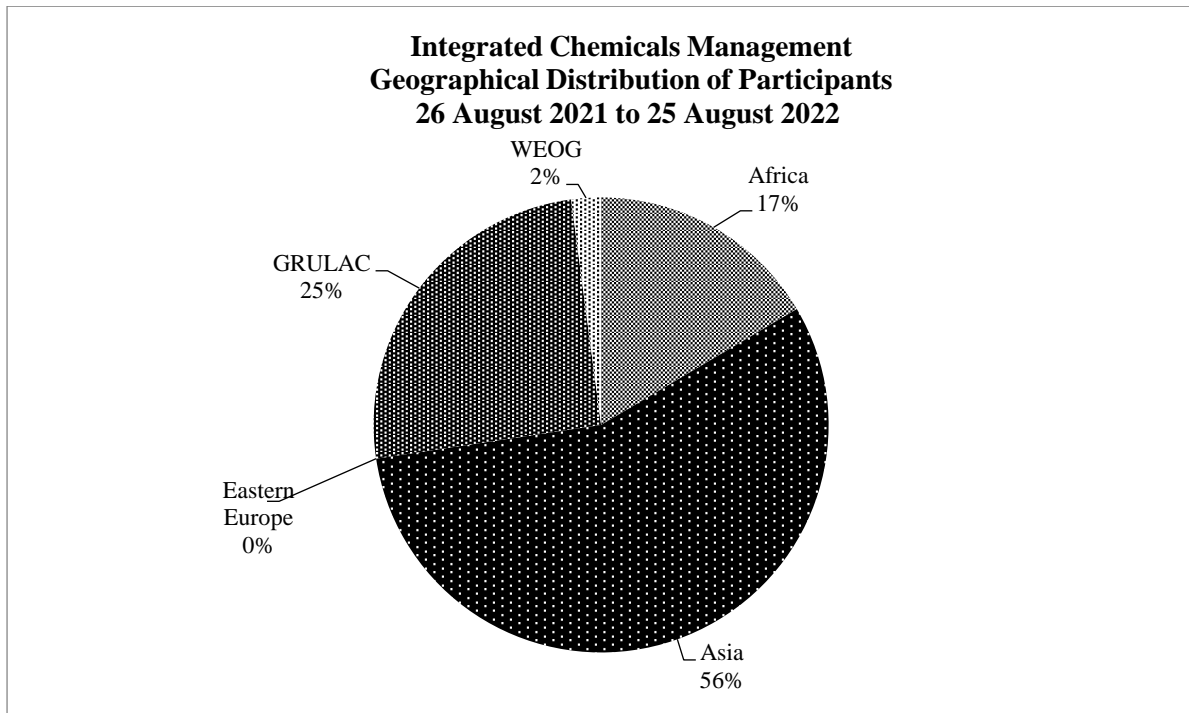
No.	Title	State Party of Researcher	Status
1.	Development and characterisation of nanostructured surfaces, oriented to recovering and monitoring heavy metals in industrial process waters	Argentina	Ongoing
2.	Polyethylene mulching in agriculture: the interaction between plastic, soil, pesticides, and 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 polymer-based nanostructured sensors for detection of hydrogen sulphide (H ₂ S)	Brazil	Ongoing
5.	Chemistry beyond chlorine: dialkyl carbonates for biomass upgrading and synthesis of heterocycles	Italy	Ongoing
6.	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
7.	Design and fabrication of chemo-sensor for food-borne mycotoxins as potential chemical warfare agents	Kenya	Ongoing
8.	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
9.	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
10.	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
11.	Investigation on the use of fabricated metals impregnated on pectin biopolymeric material as sustainable absorbents in solid phase extraction for pre-concentration of mycotoxins in cassava product samples	Malaysia	Ongoing
12.	Green synthesis of silver doped zinc oxide nanoparticles using aqueous leaves extract incorporated with activated carbon from oil palm kernel shell (Ag-ZnO-NPs/AC) and its mechanistic study towards photodegradation of organochlorine pesticide (OCPs) in water samples	Malaysia	Ongoing

No.	Title	State Party of Researcher	Status
13.	Adsorption and detection of model compounds analogous to chemical warfare agents by metal-organic framework CAU-1	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.	Biomass valorization to enhance efficiency of toxic metals bioremediation from military and industry areas	Poland	Ongoing
17.	Diagnosis of schizophrenia and bipolar disorder by NMR-based metabolomics and lipidomics	Serbia	Ongoing
18.	Detection of herbs and dietary supplements fraud using metabolomics approach	Serbia	Ongoing
19.	Metabolomic fingerprints of schizophrenia and bipolar disorder	Serbia	Ongoing
20.	Monitoring the distribution of emerging micropollutants in food crops irrigated with reclaimed water	South Africa	Ongoing
21.	A novel approach to chlorine exposure: Raman spectroscopy Part II	Türkiye	Ongoing
22.	Turning industrial waste into value-added chemical products	Uruguay	Ongoing

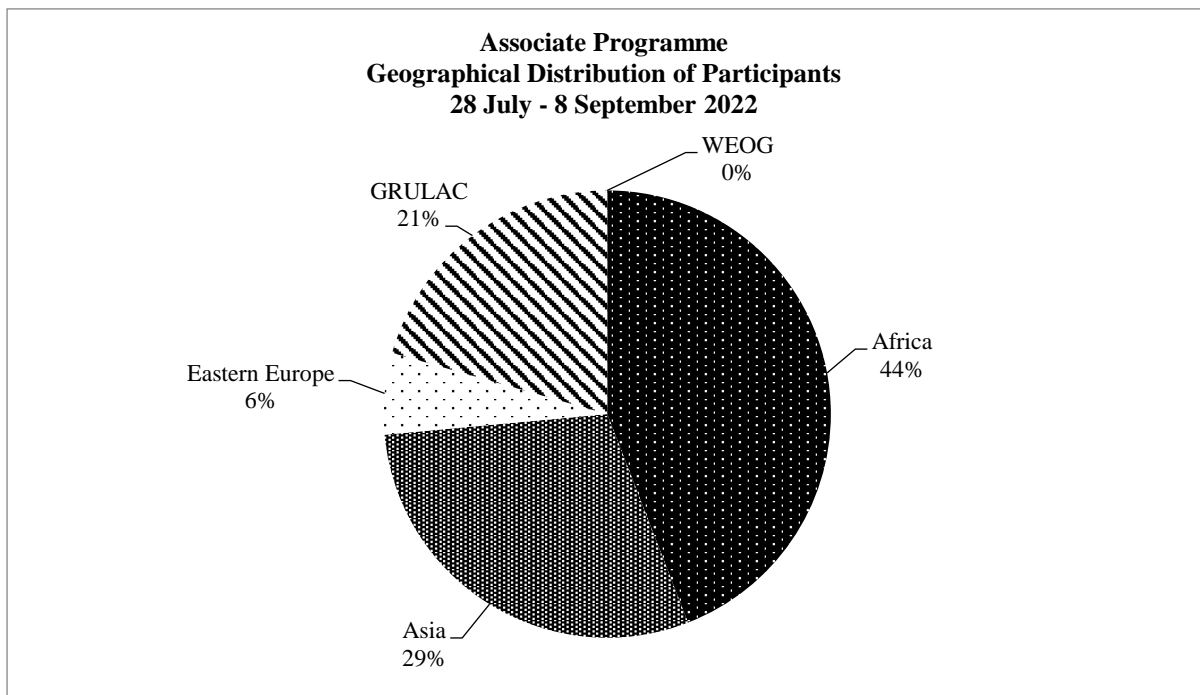
Annex 4

EVALUATION OF INTERNATIONAL COOPERATION PROGRAMMES

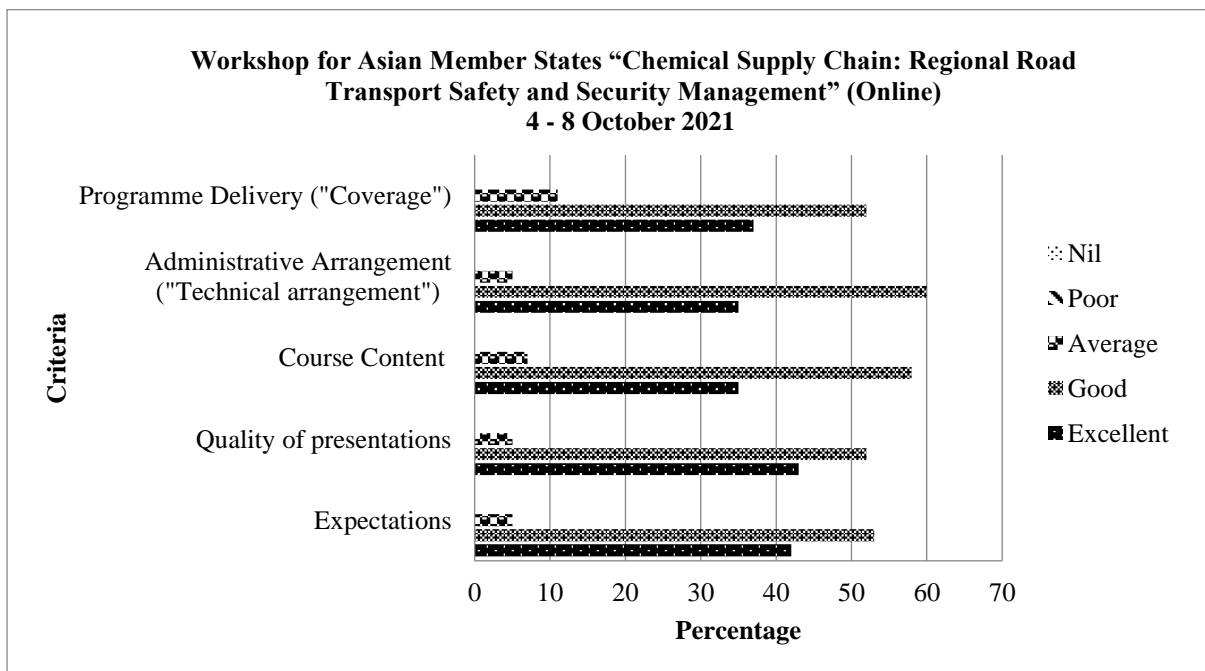
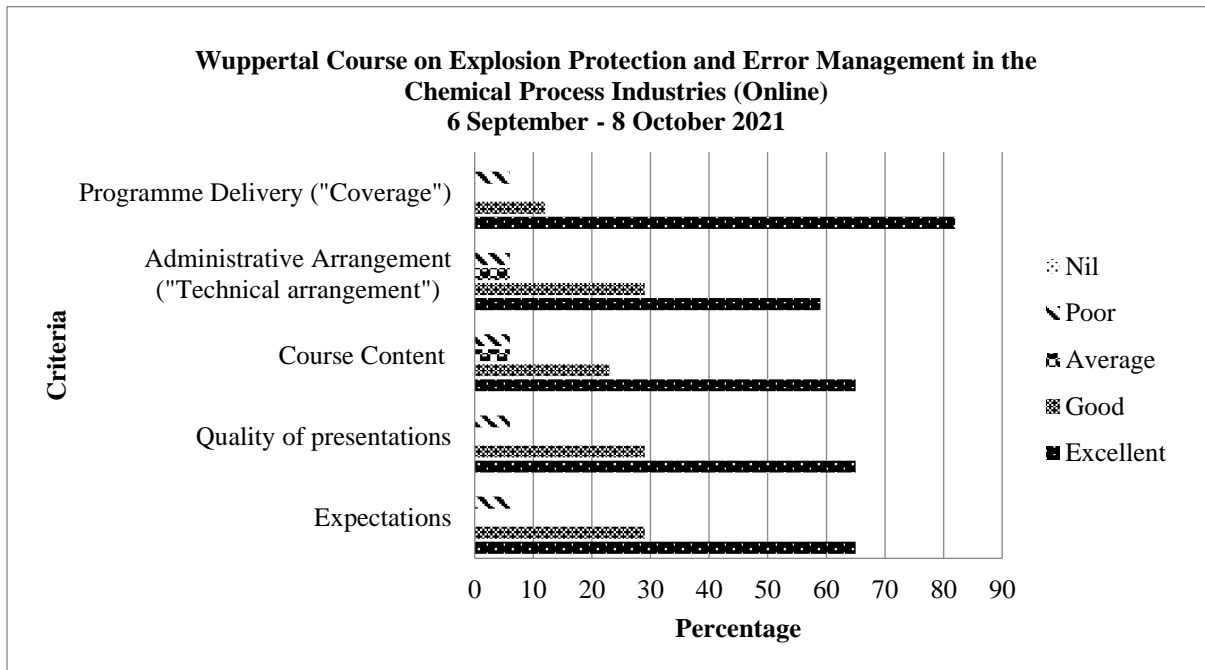
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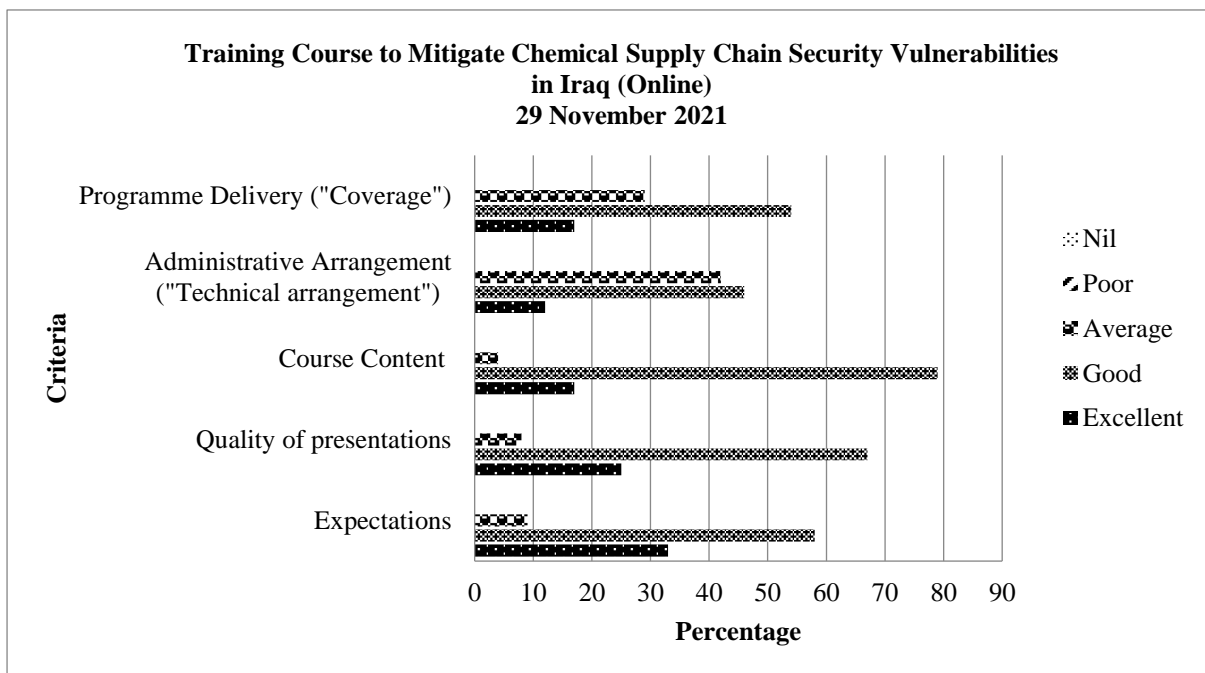
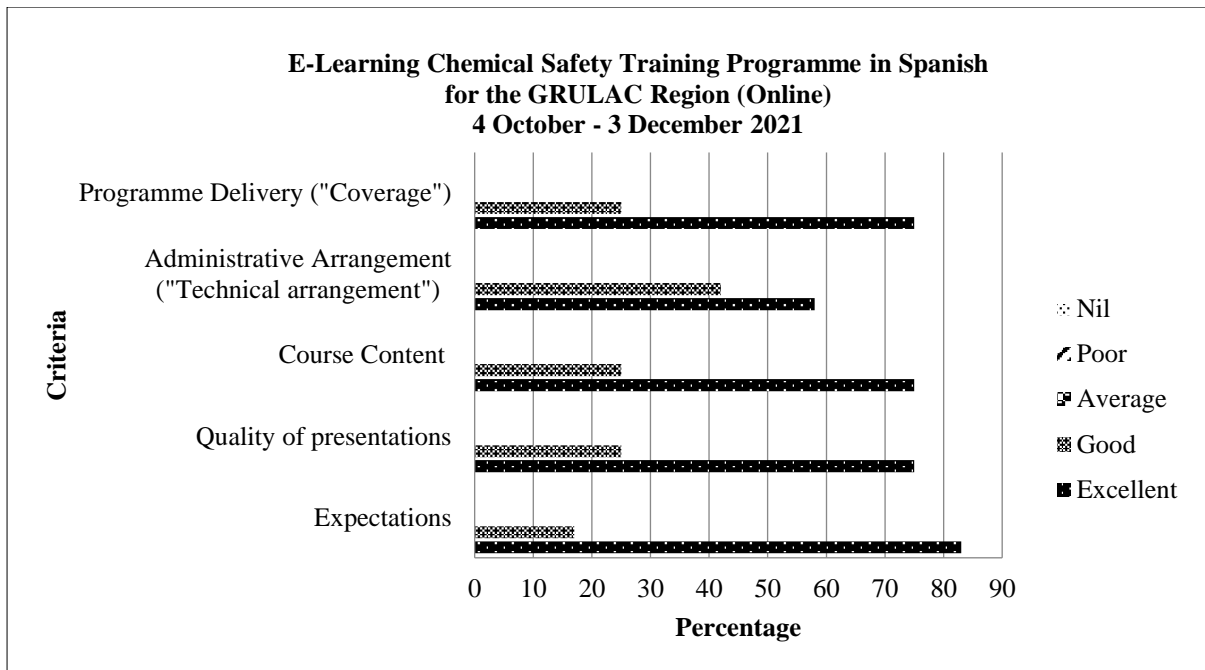


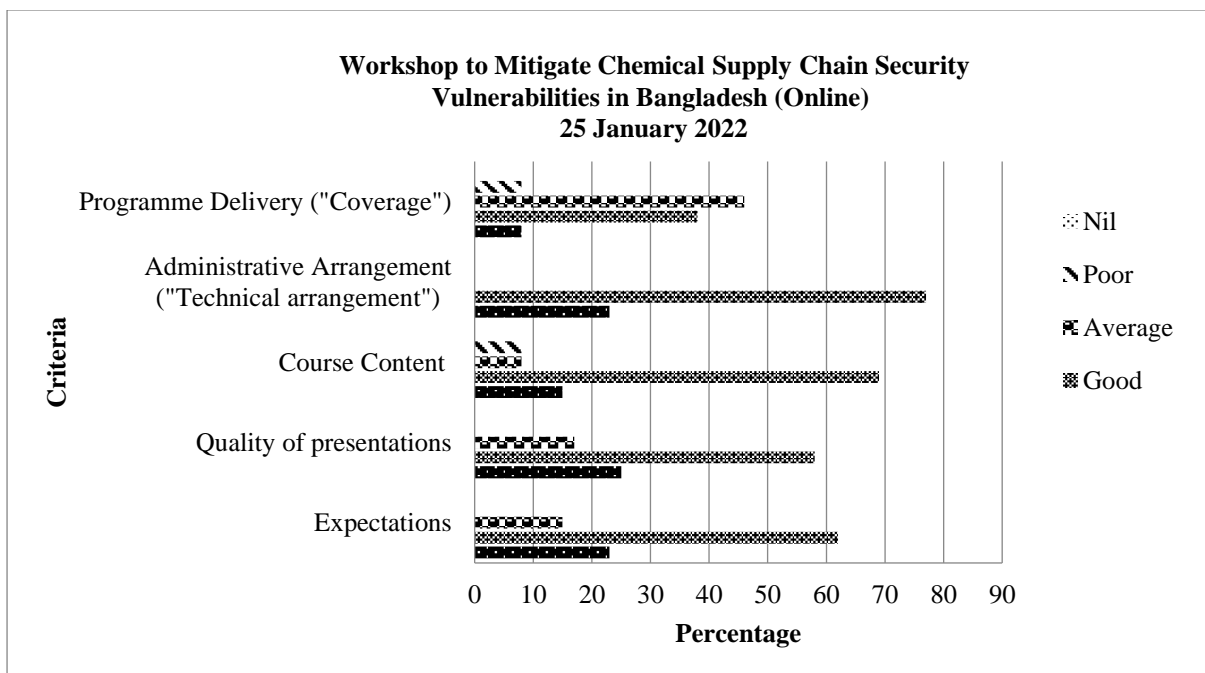
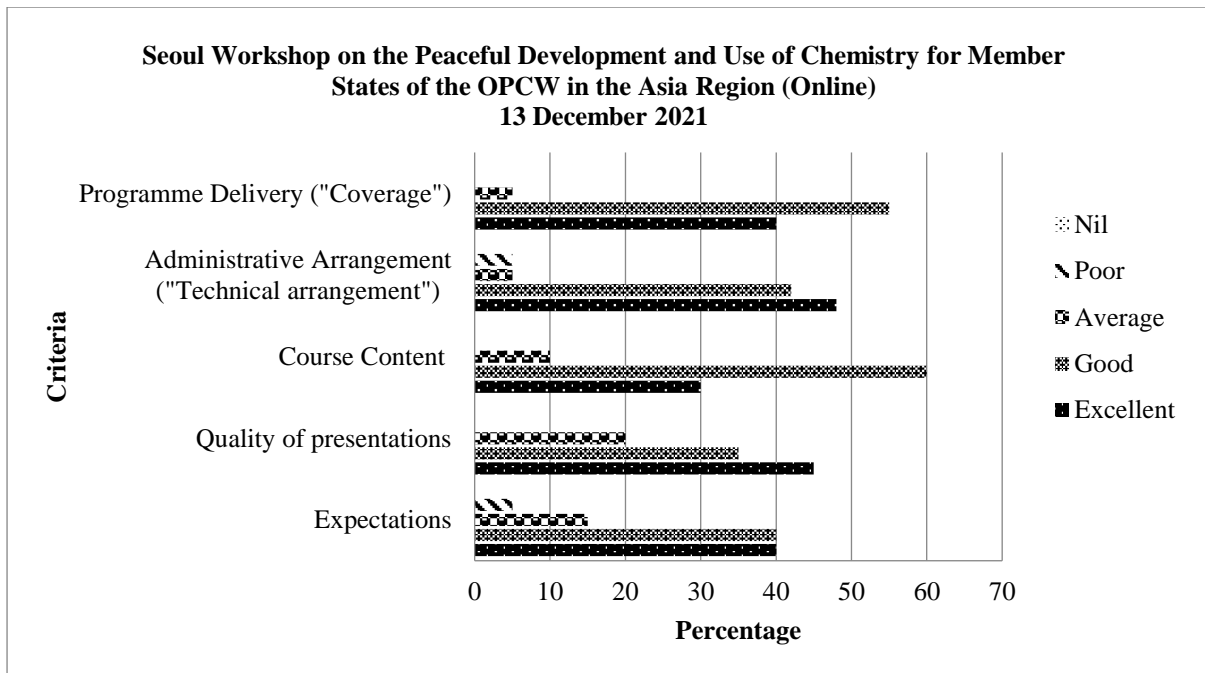
Associate Programme

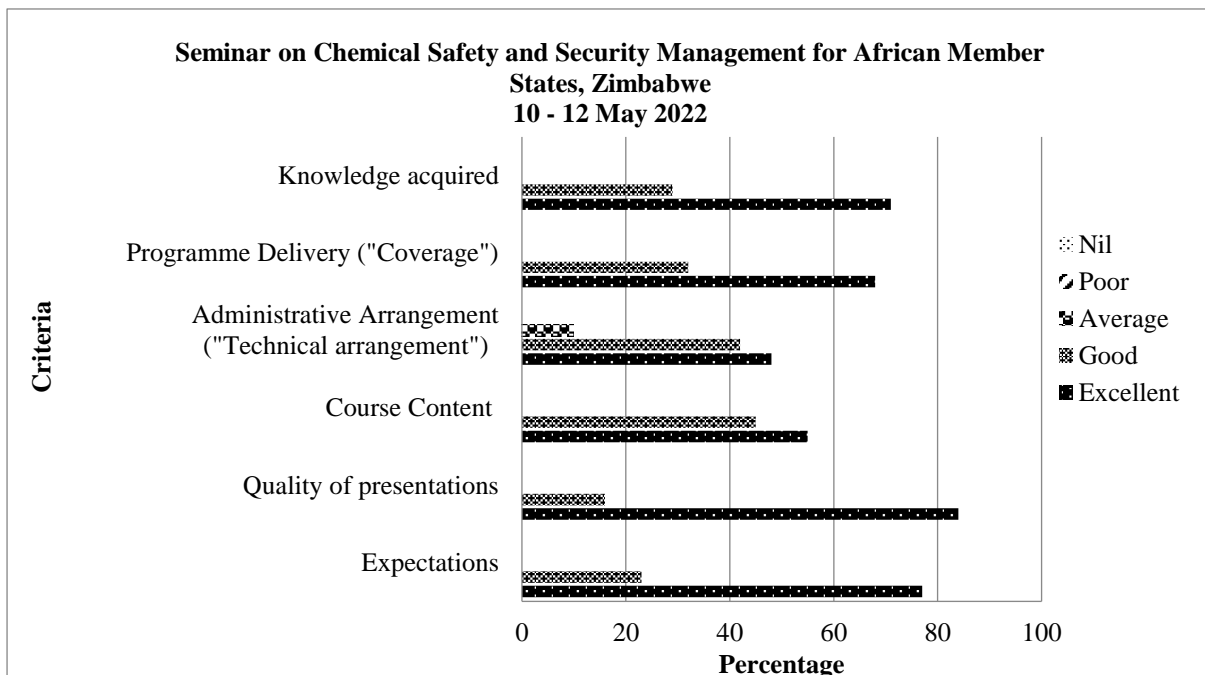
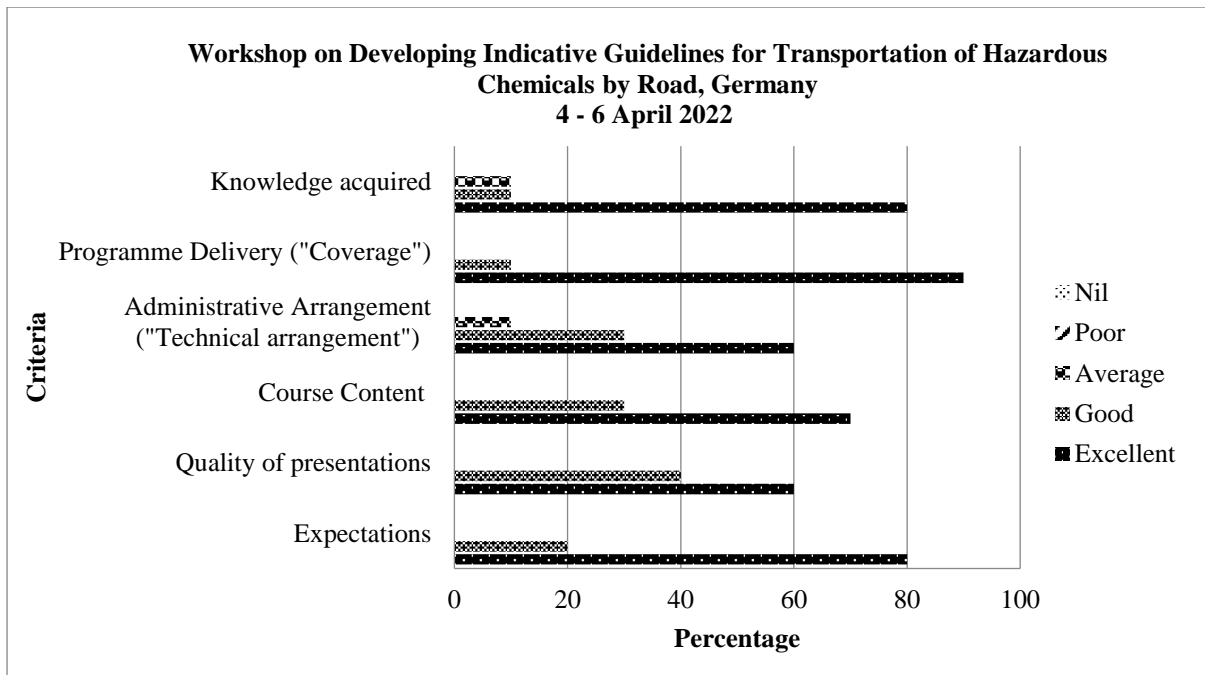


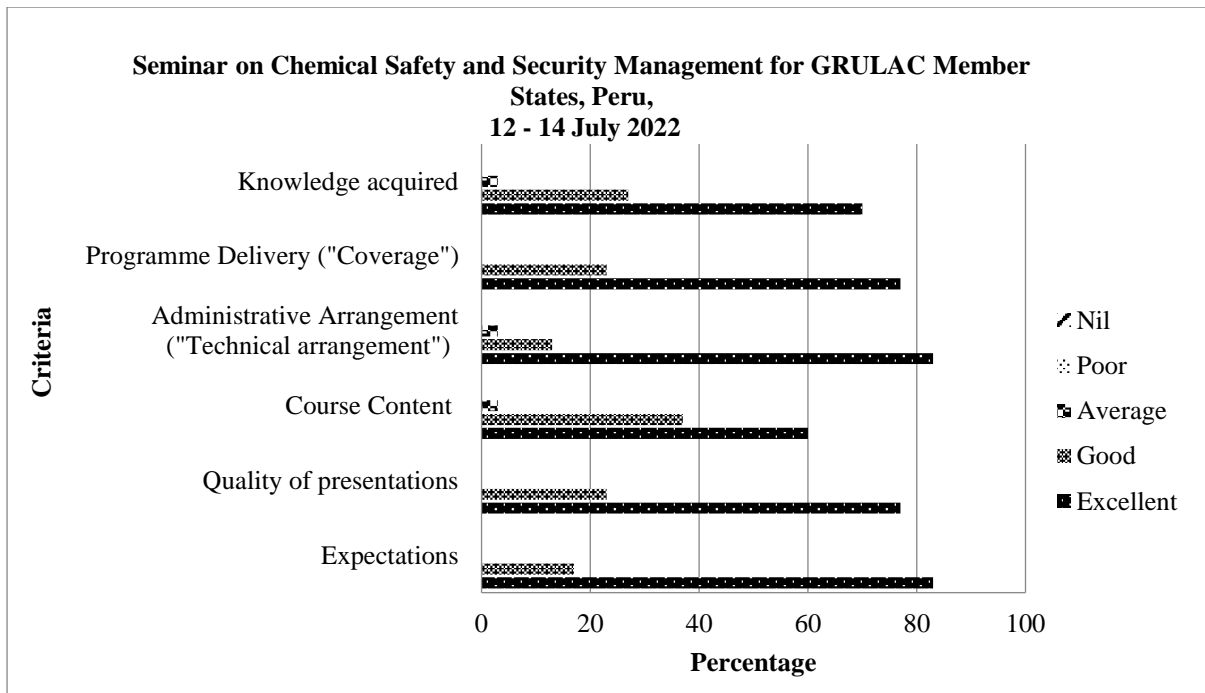
Chemical safety and security management



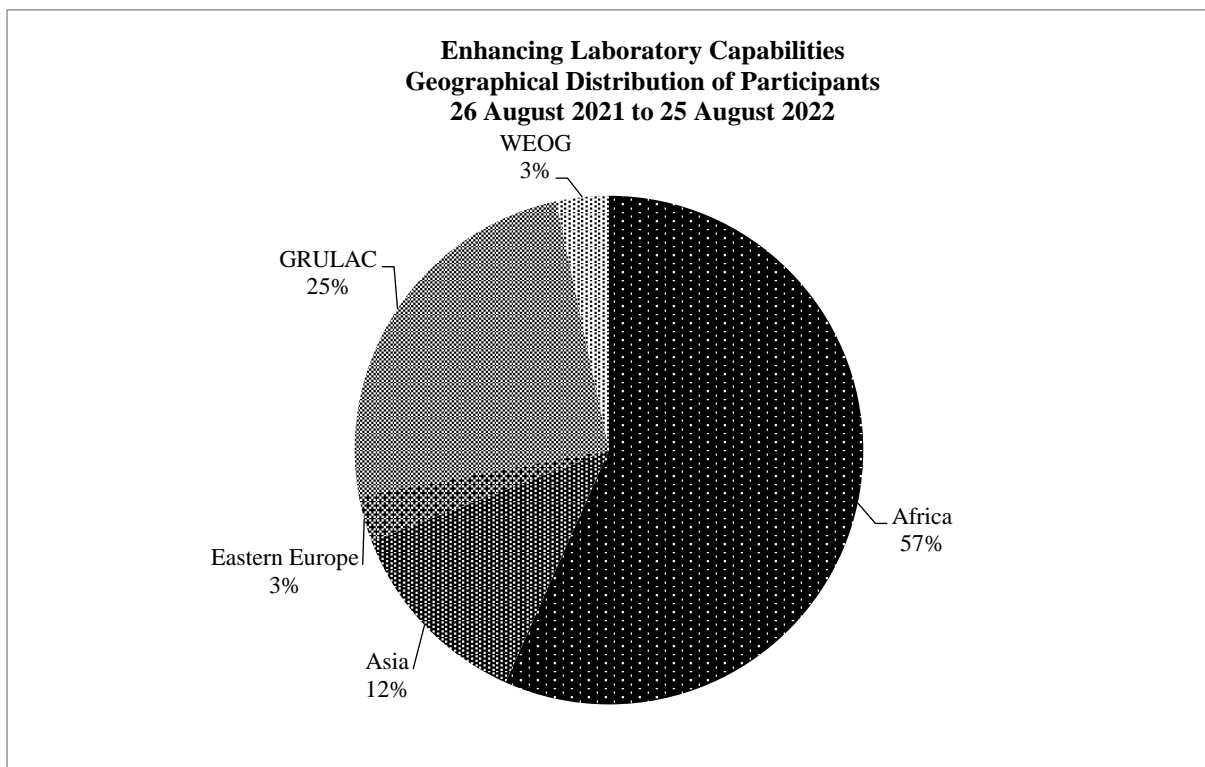




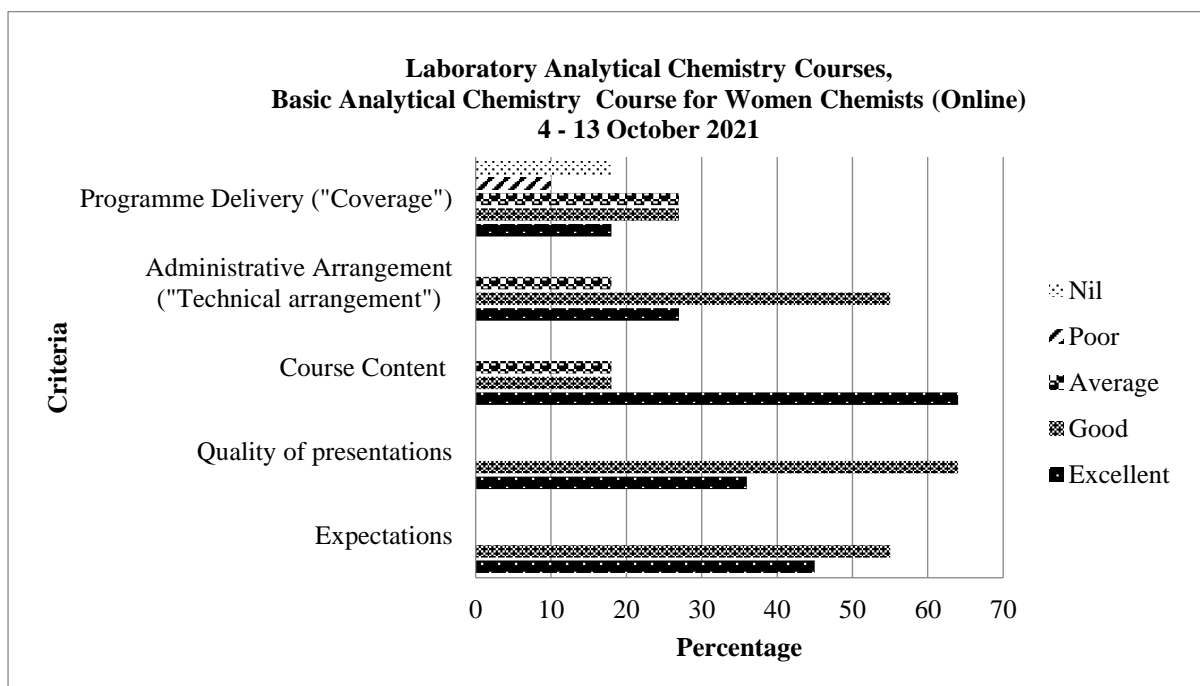
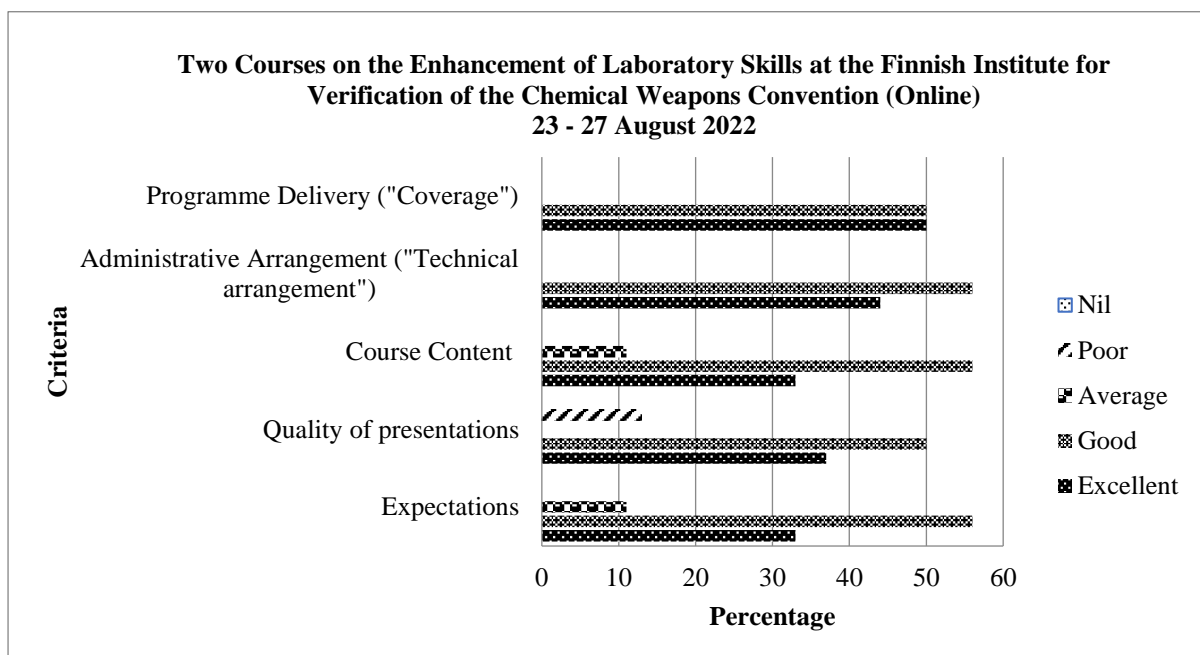


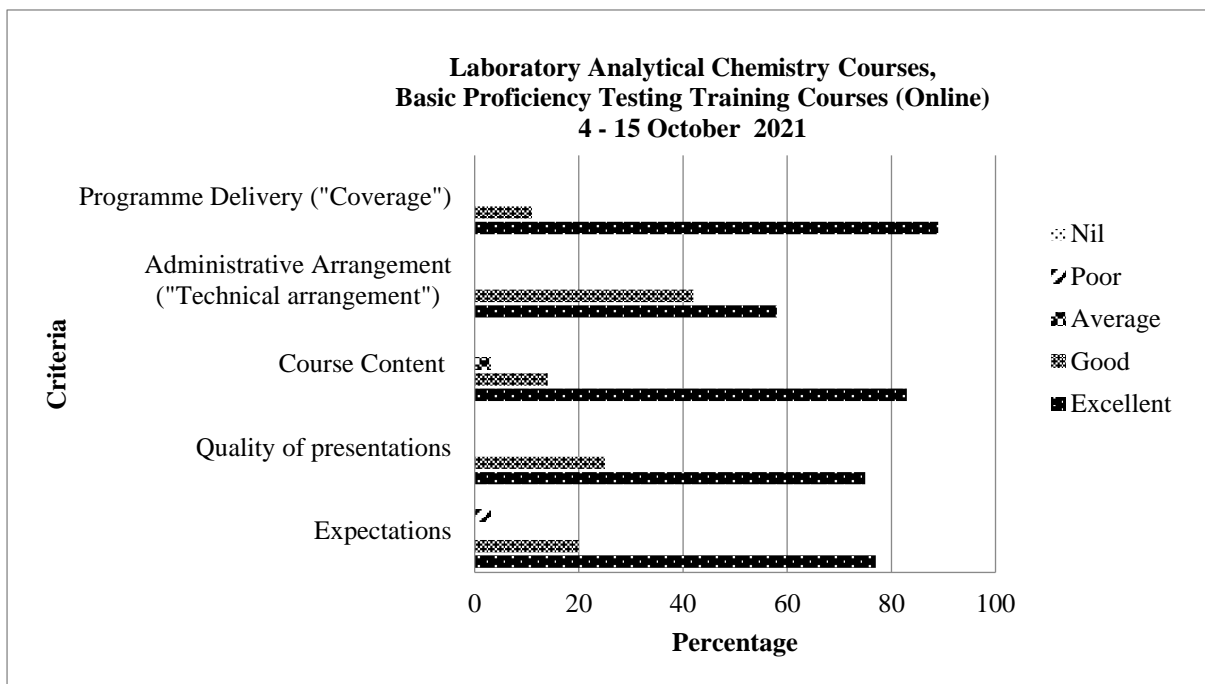
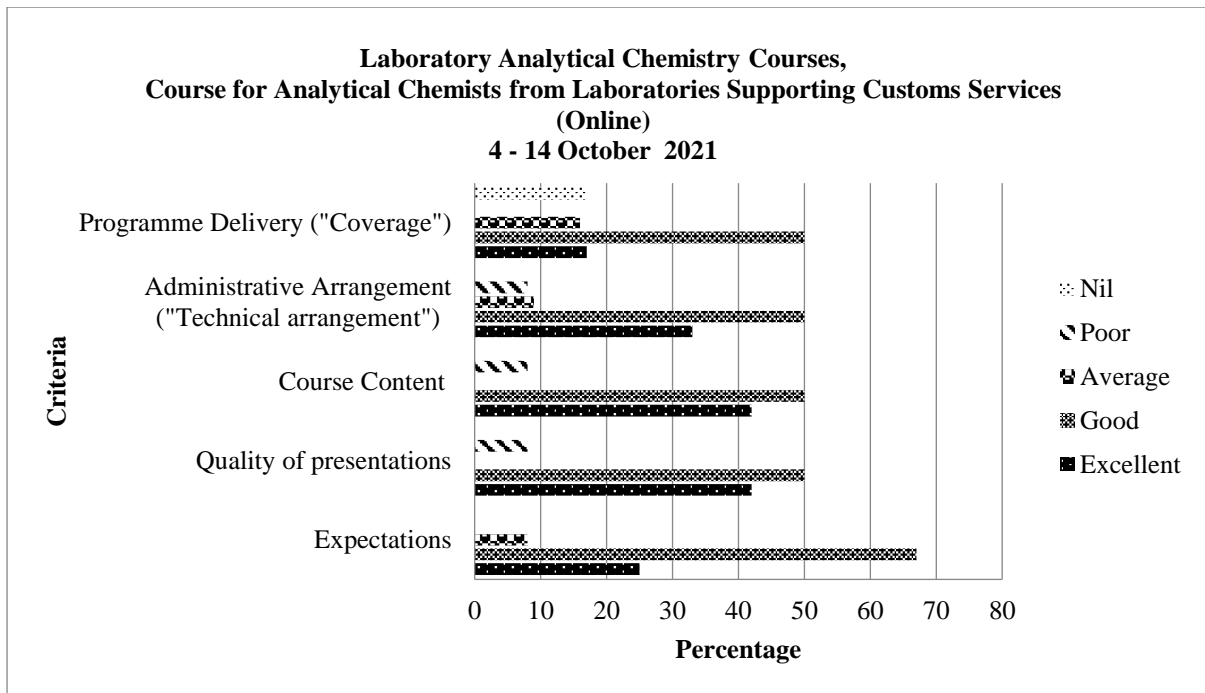


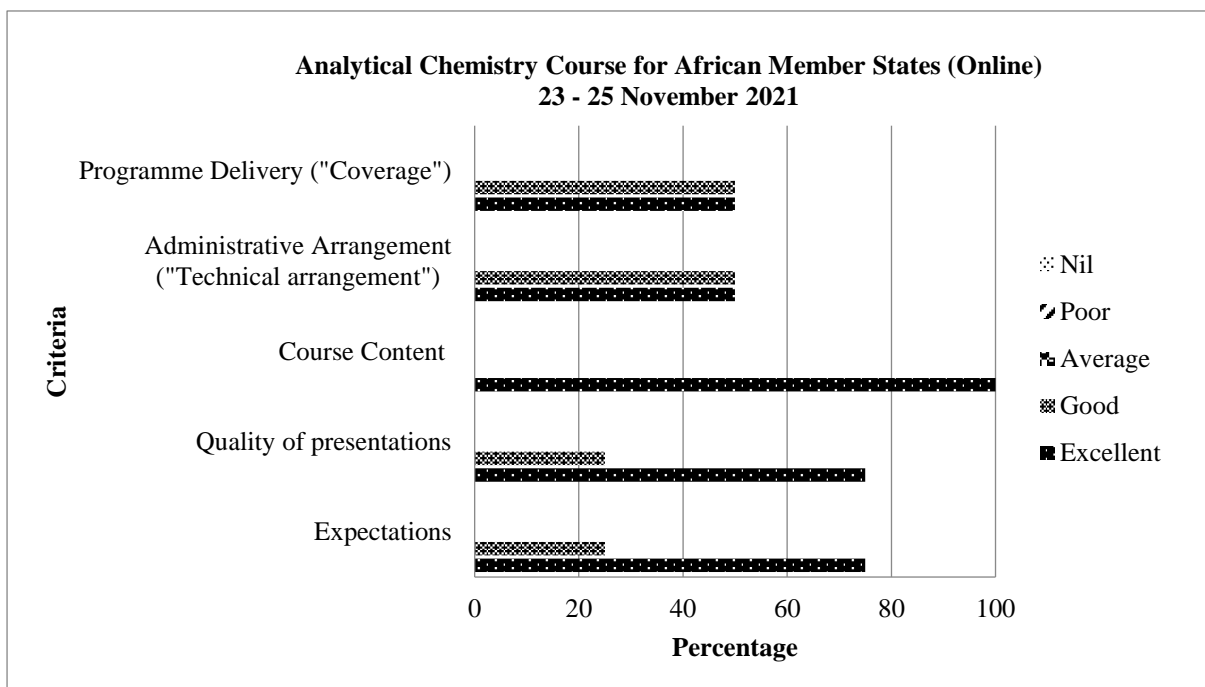
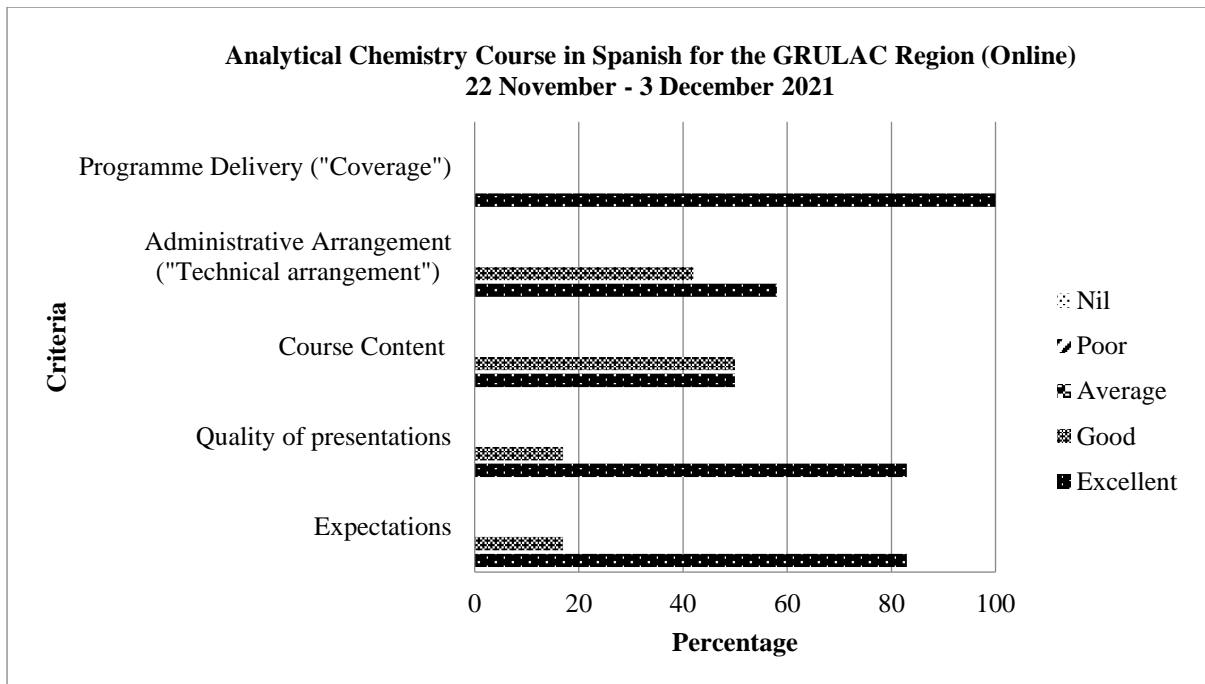
2. ENHANCEMENT OF LABORATORY CAPABILITIES

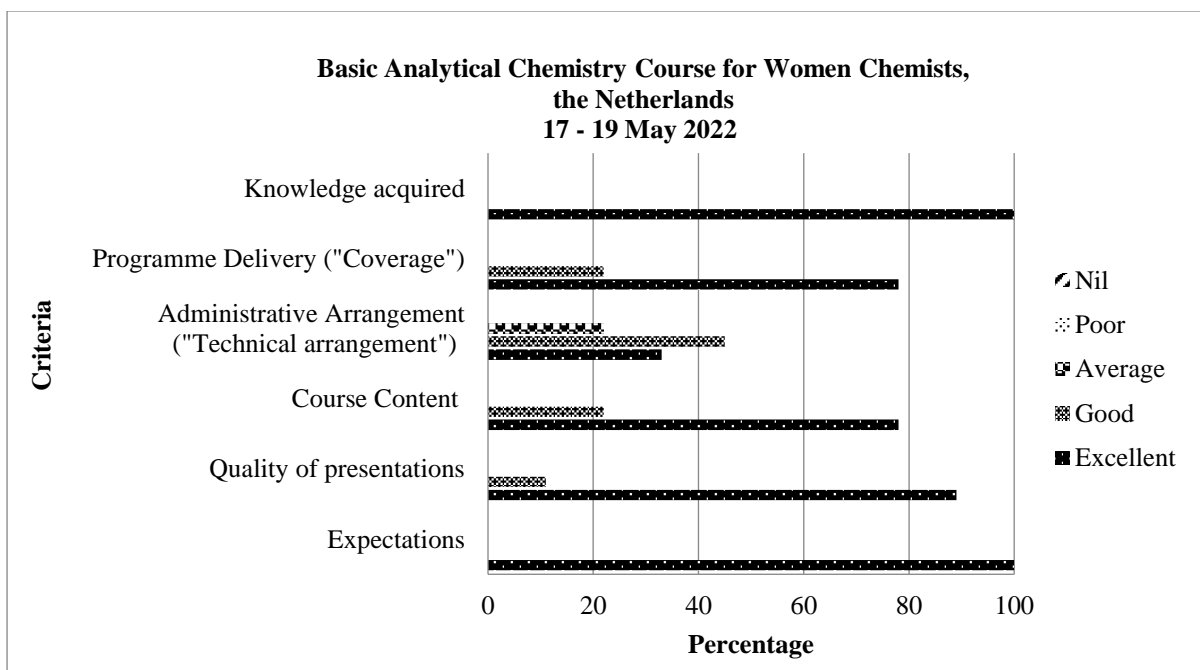
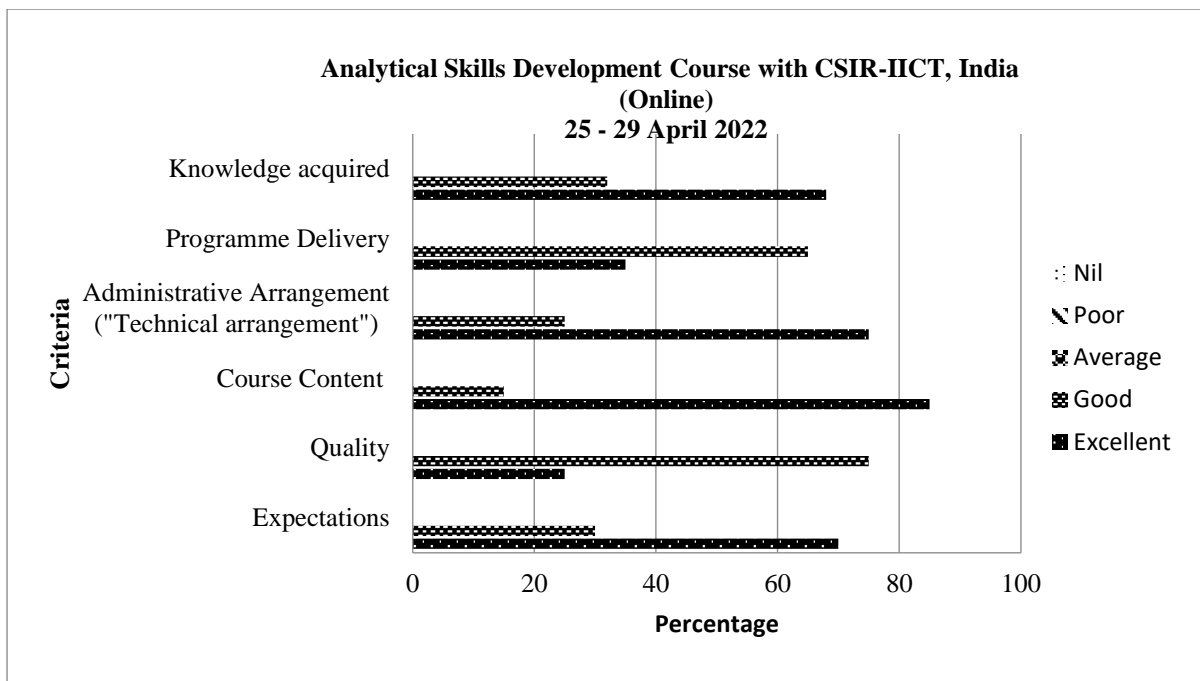


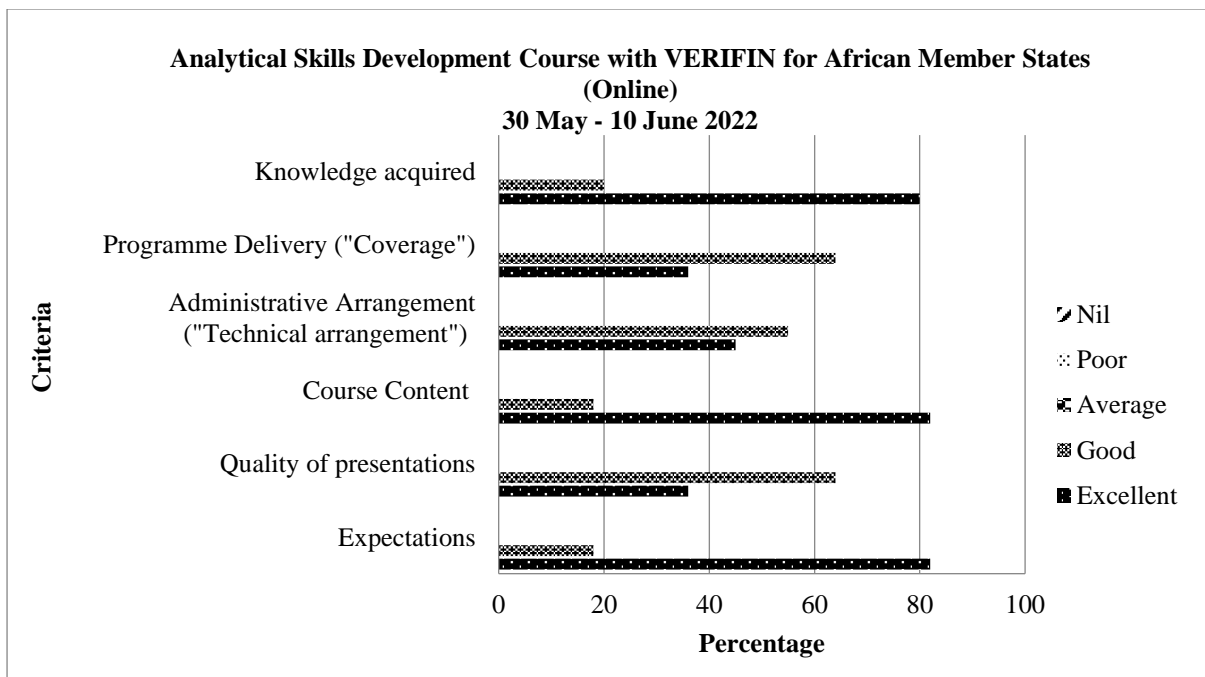
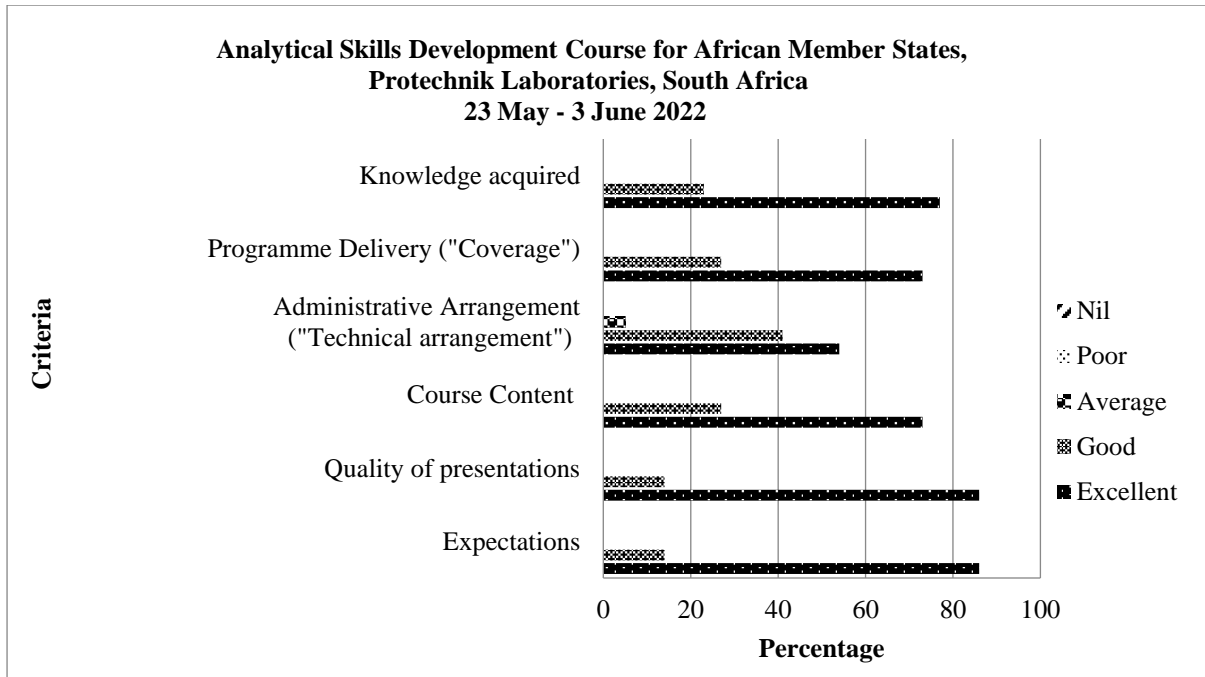
Analytical skills development courses and proficiency testing training



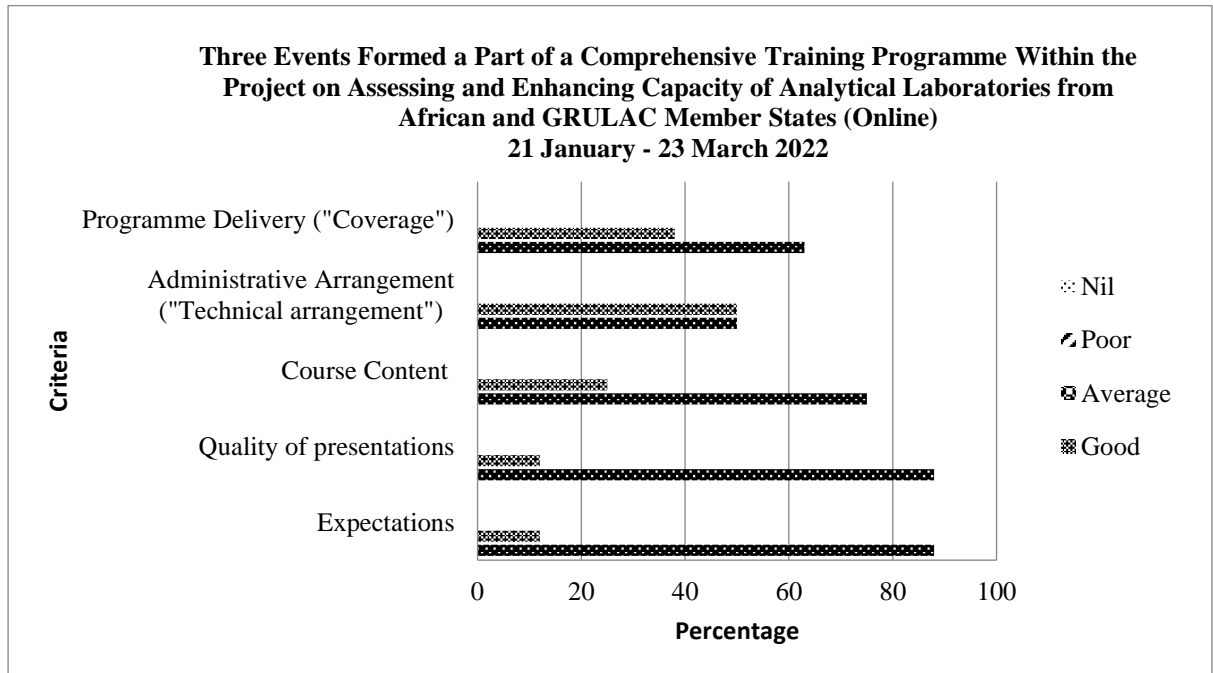
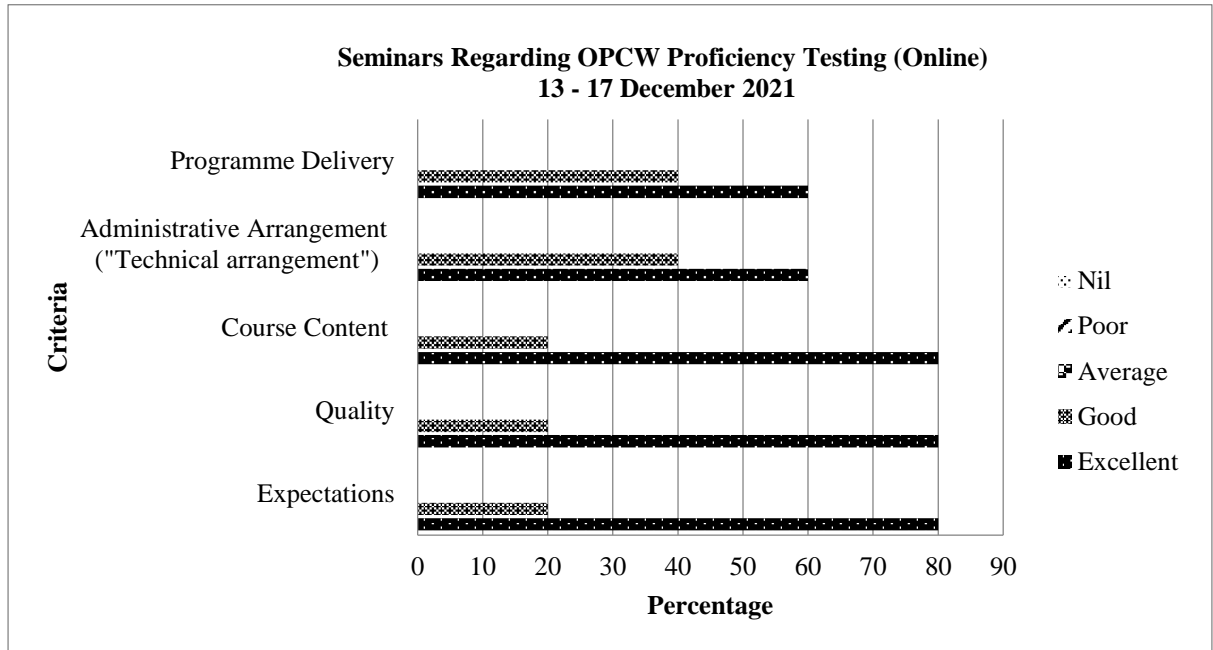


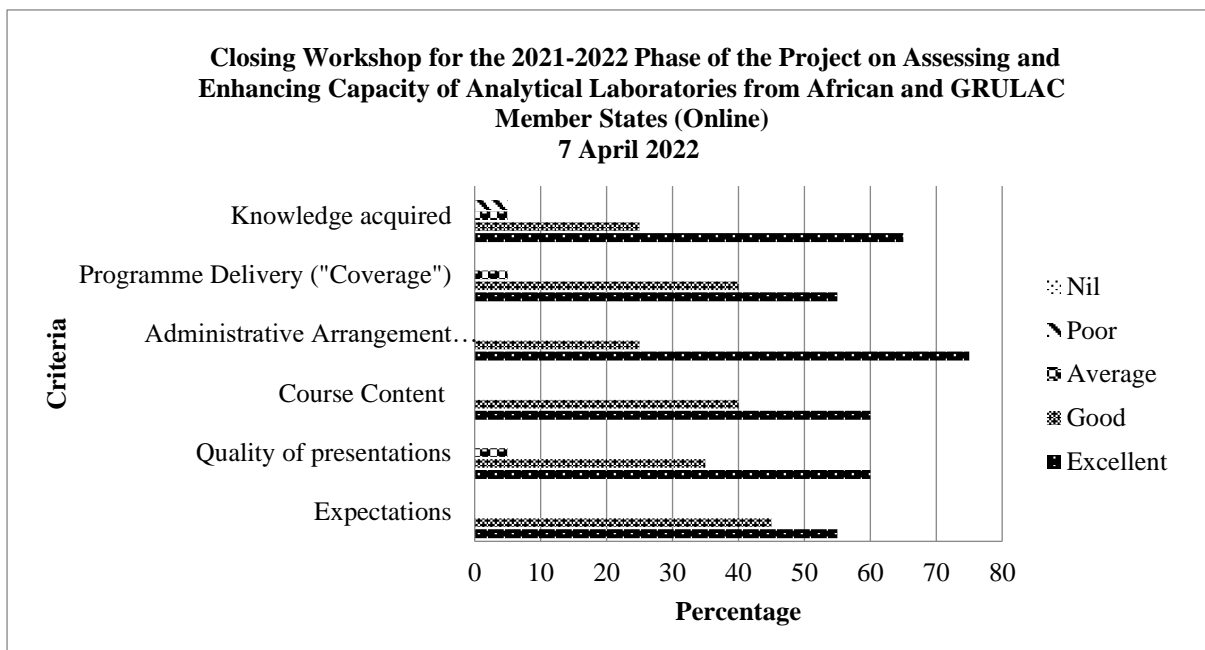
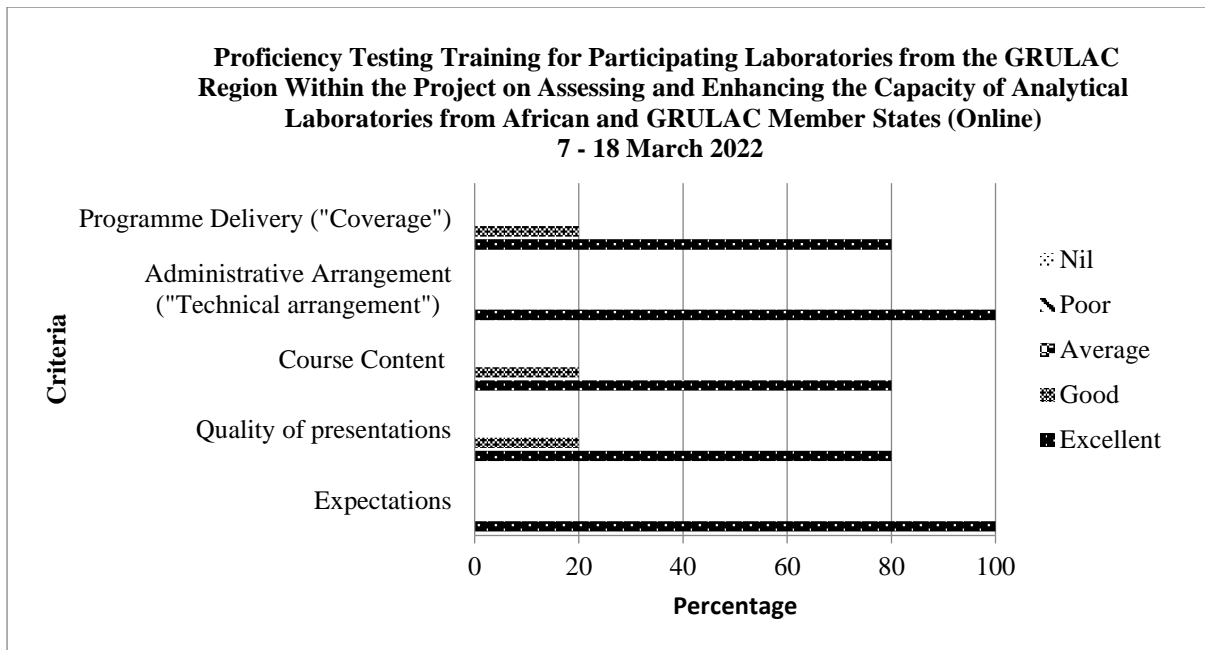






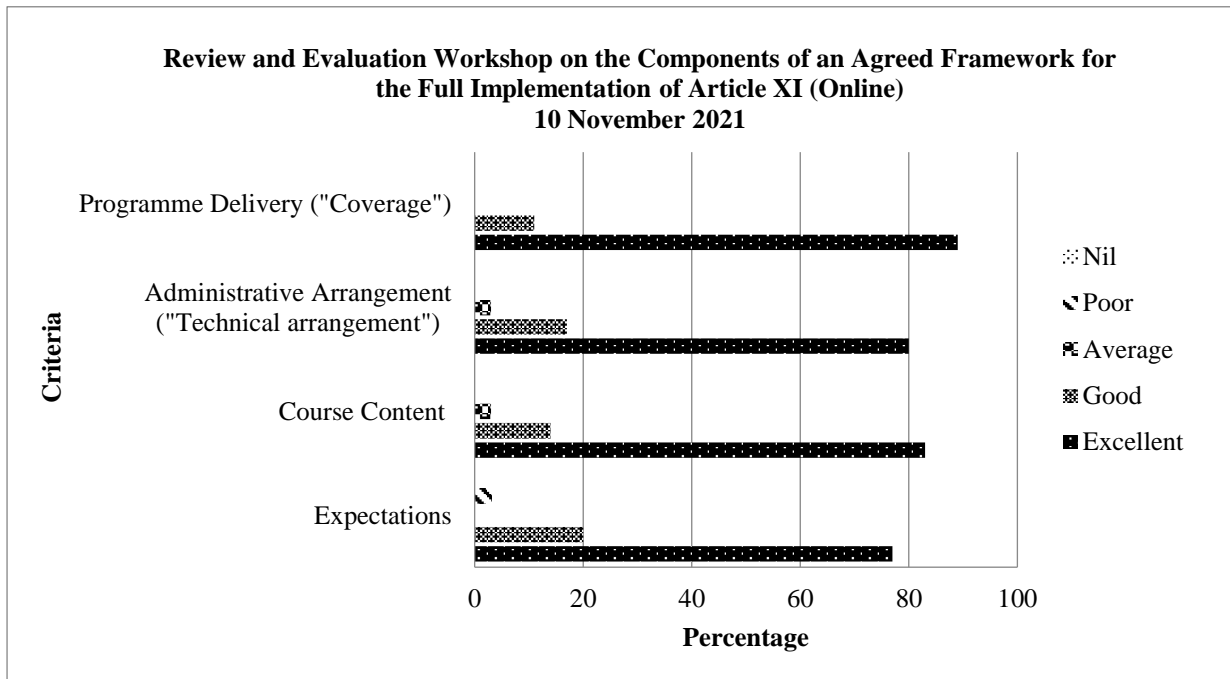
Laboratory Assistance Programme



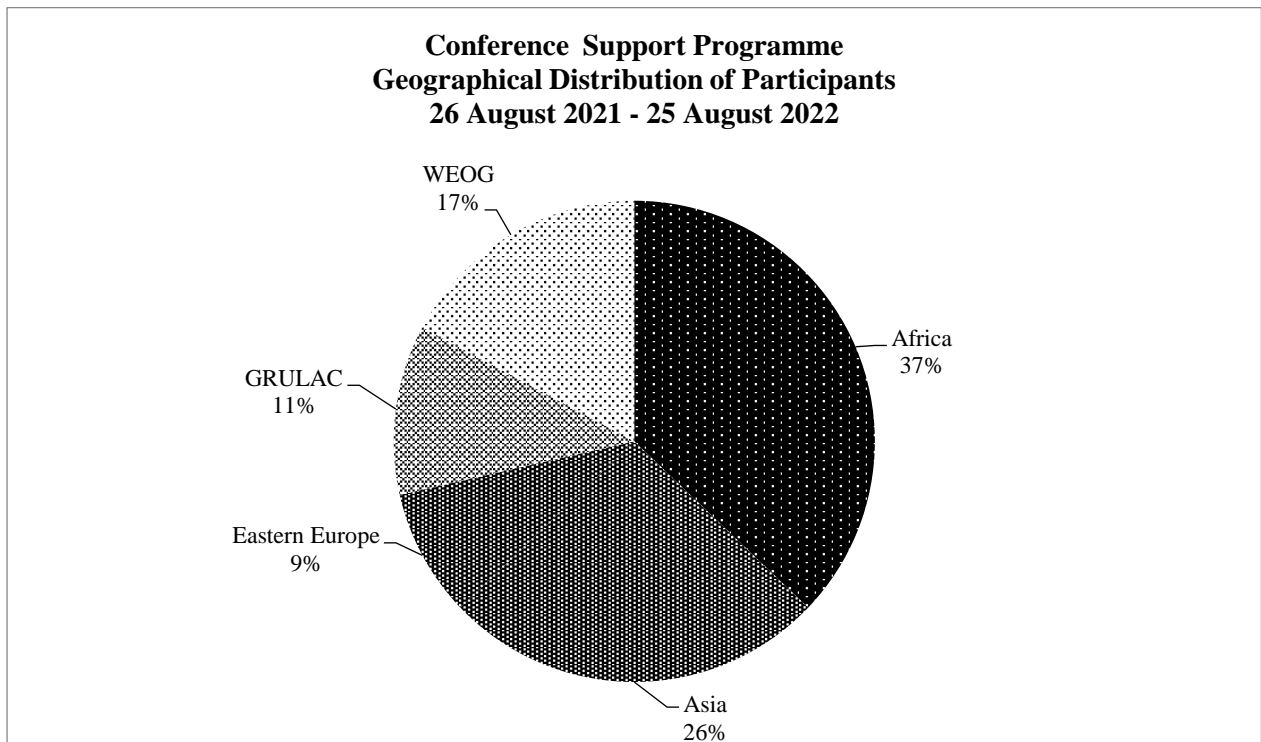


3. CHEMICAL KNOWLEDGE PROMOTION AND EXCHANGE

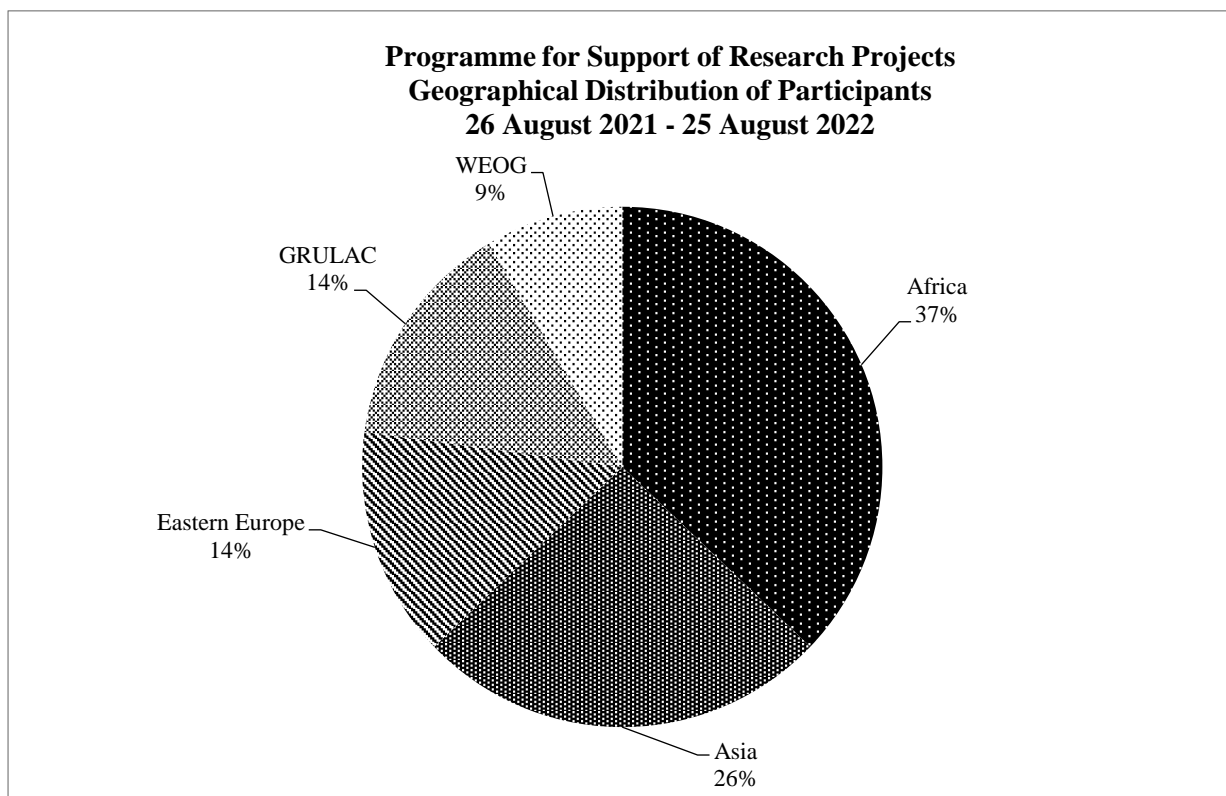
Article XI Workshop



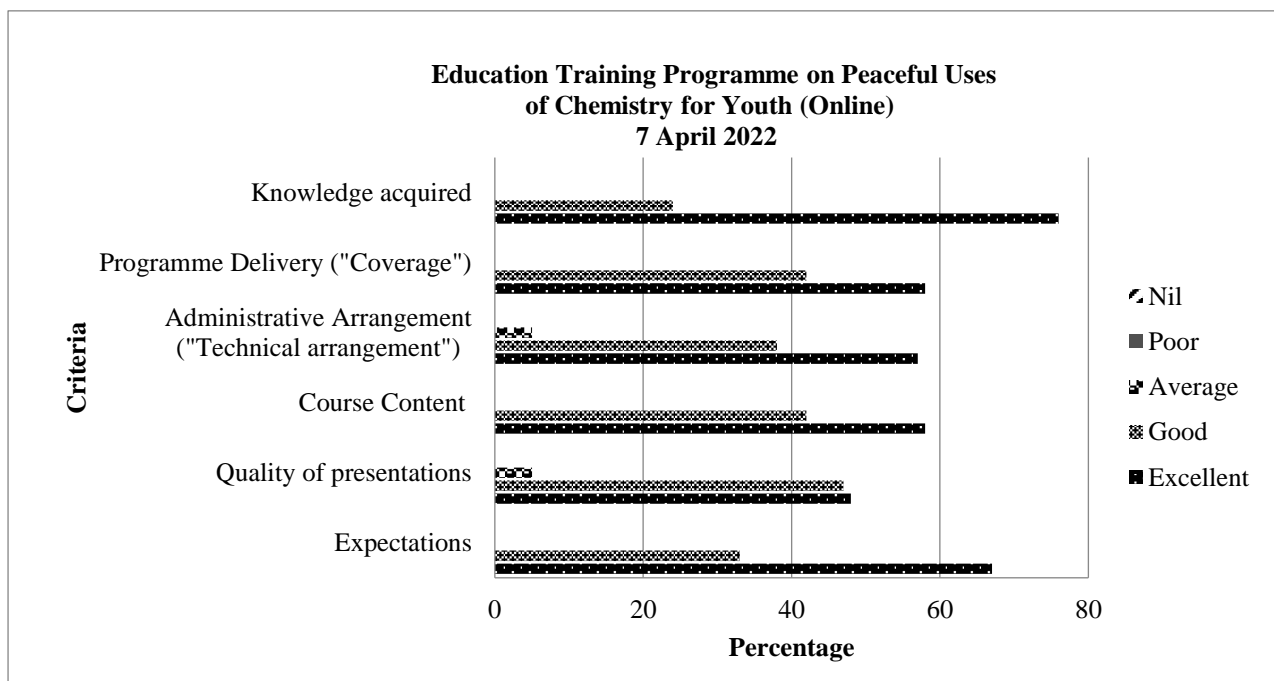
Conference Support Programme

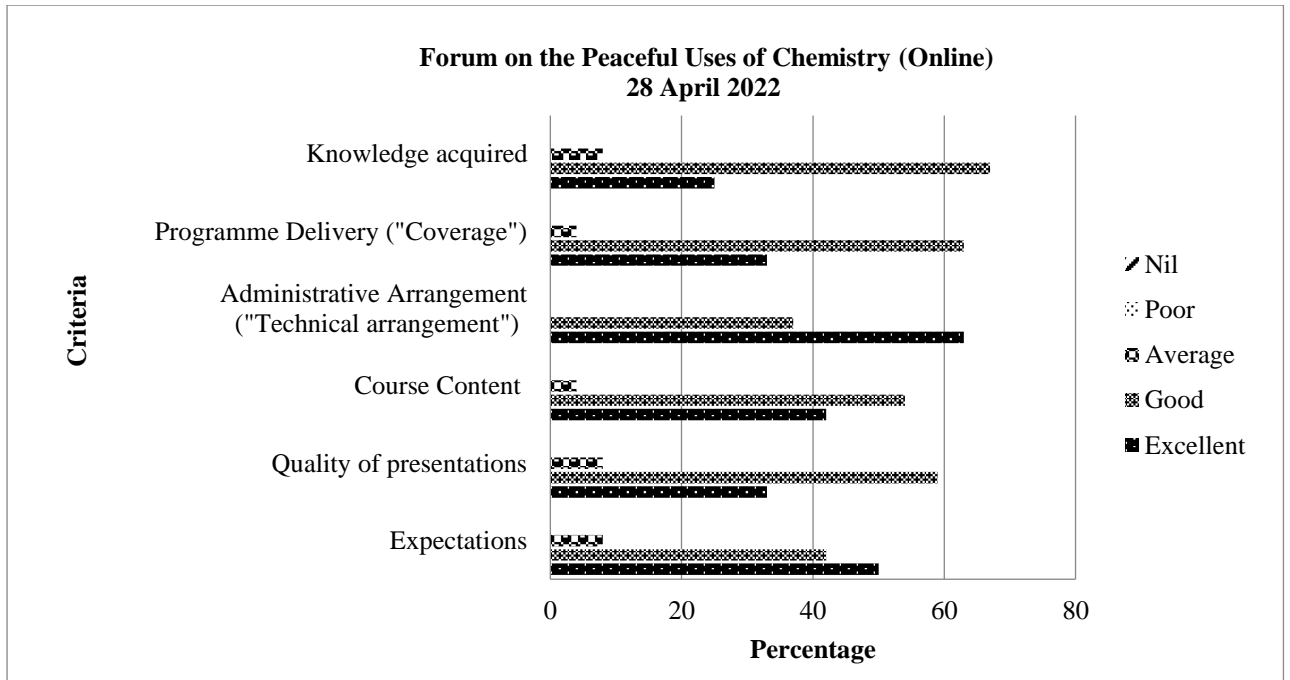


Programme for Support of Research Projects

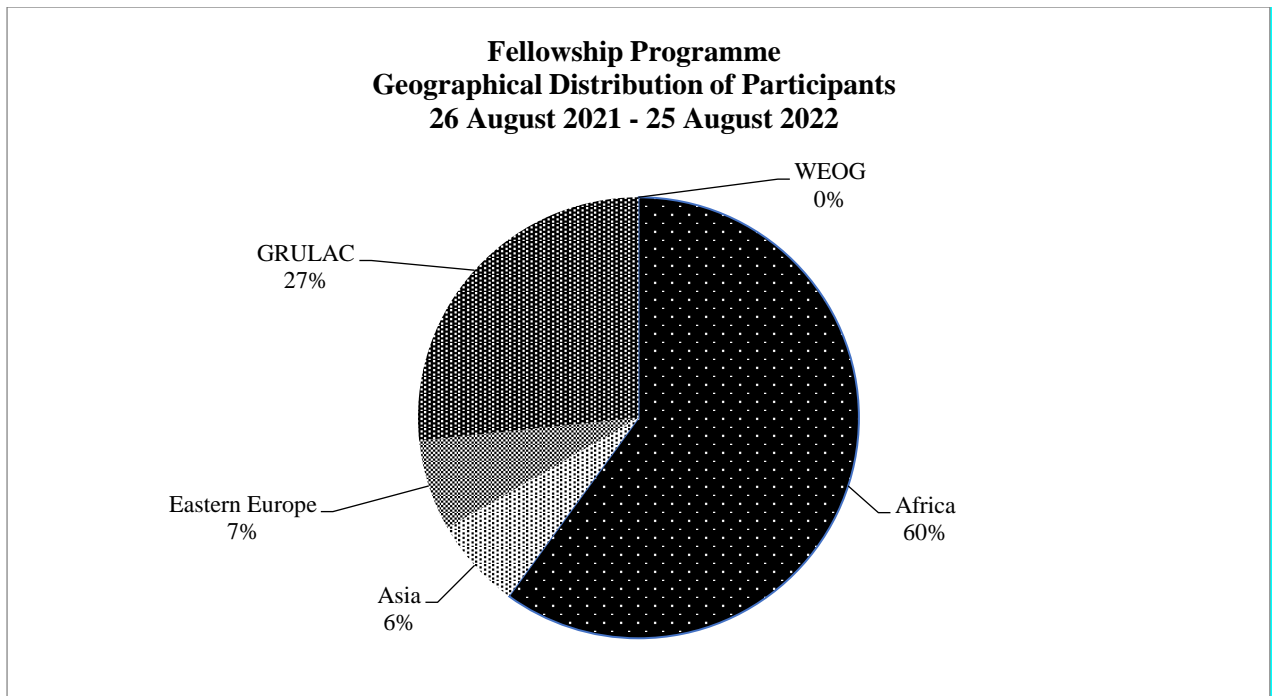


Building a Knowledge Society



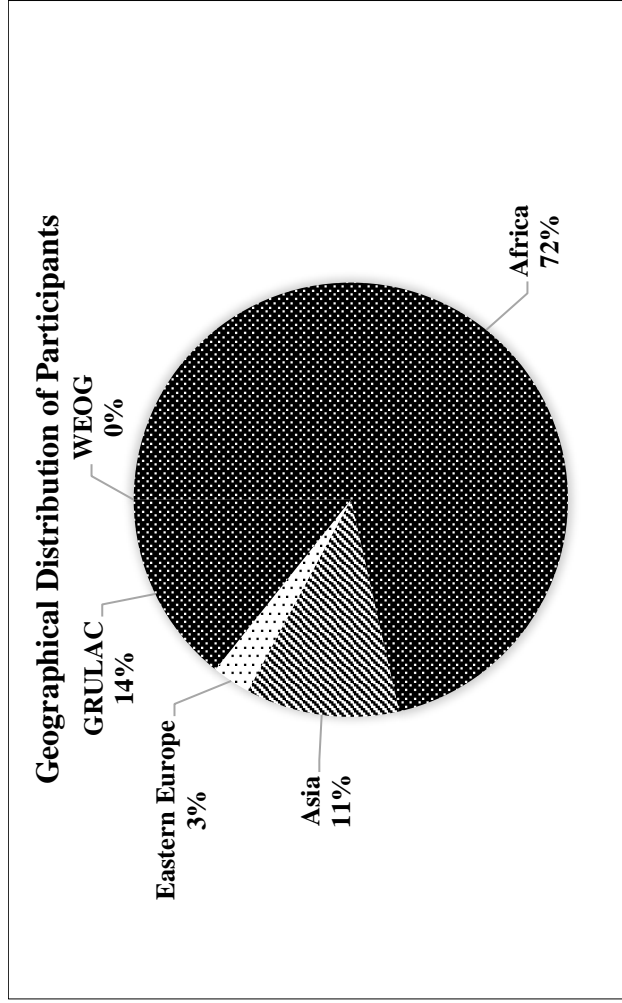
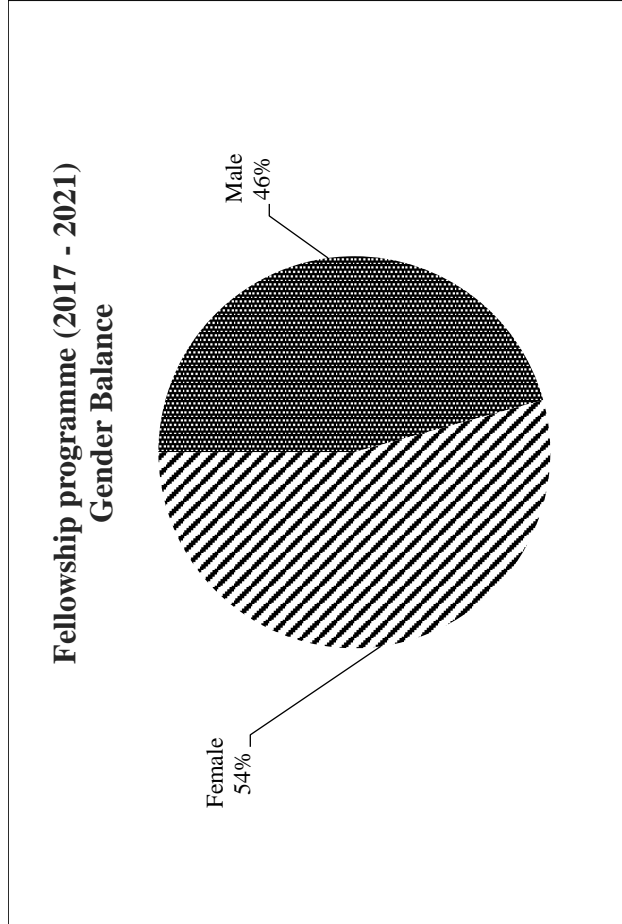


Fellowship Programme

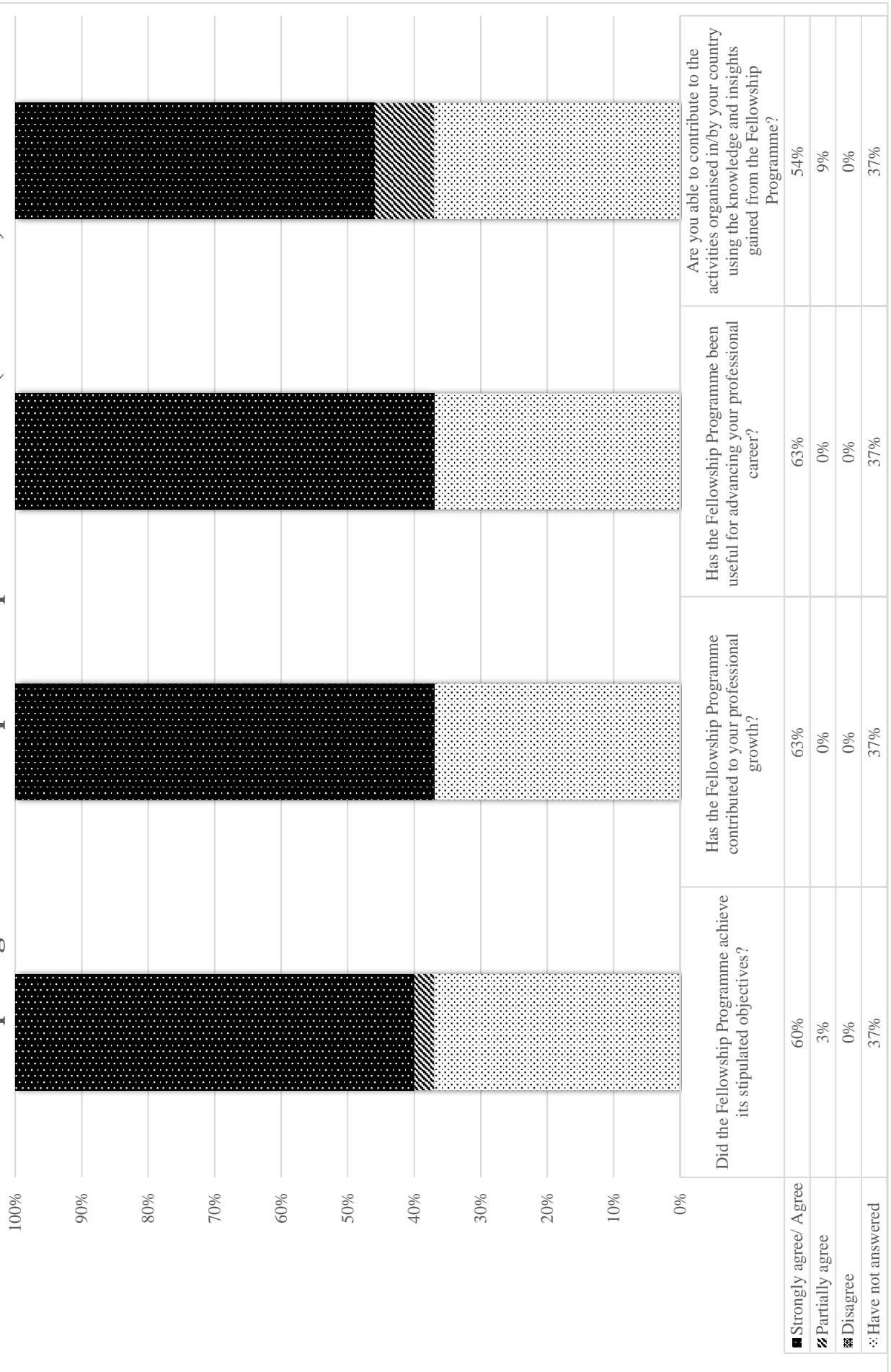


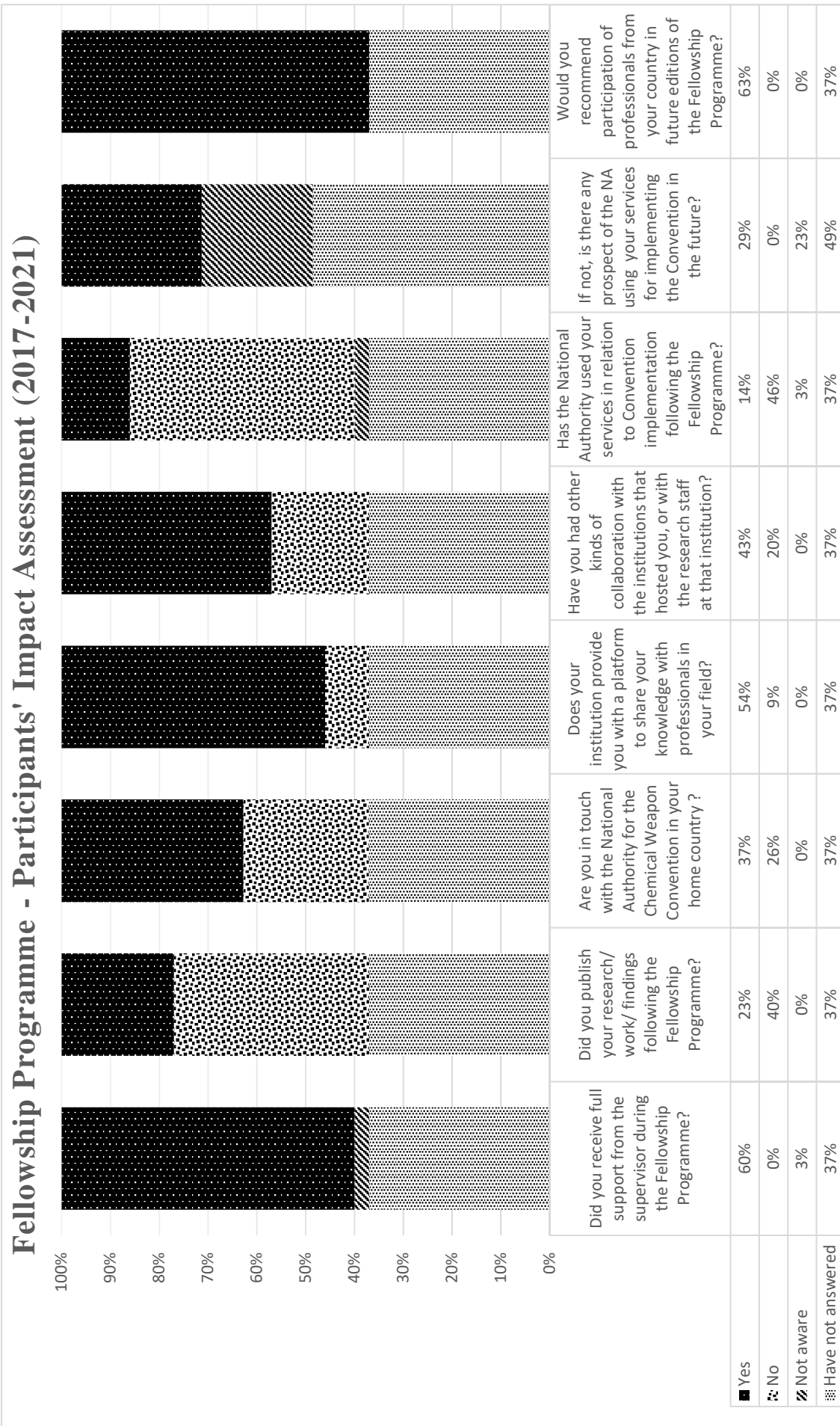
Annex 5

IMPACT ASSESSMENT OF INTERNATIONAL COOPERATION PROGRAMMES
FELLOWSHIP PROGRAMME 2017 – 2021

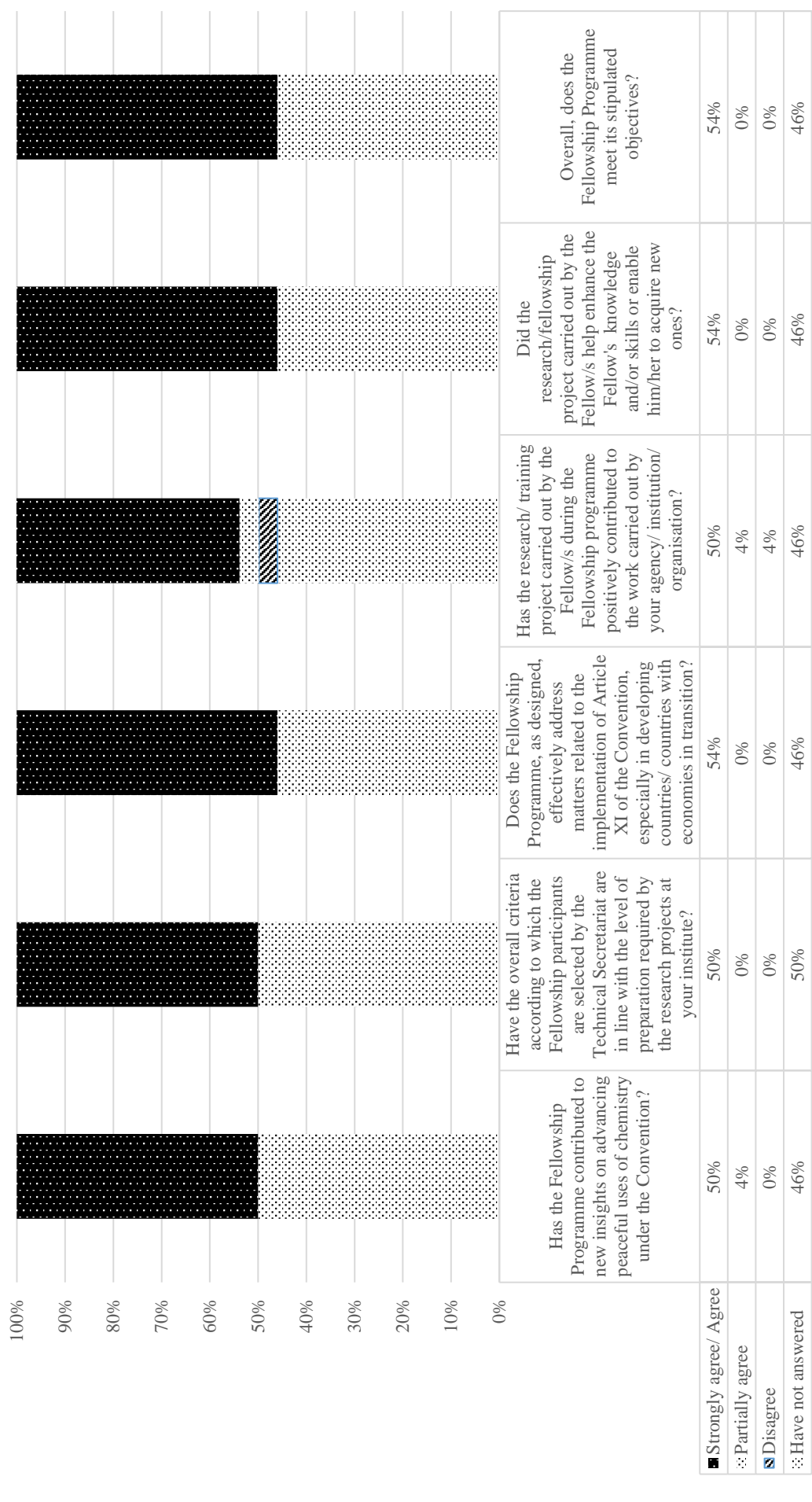


Fellowship Programme - Participants' Impact Assessment (2017-2021)

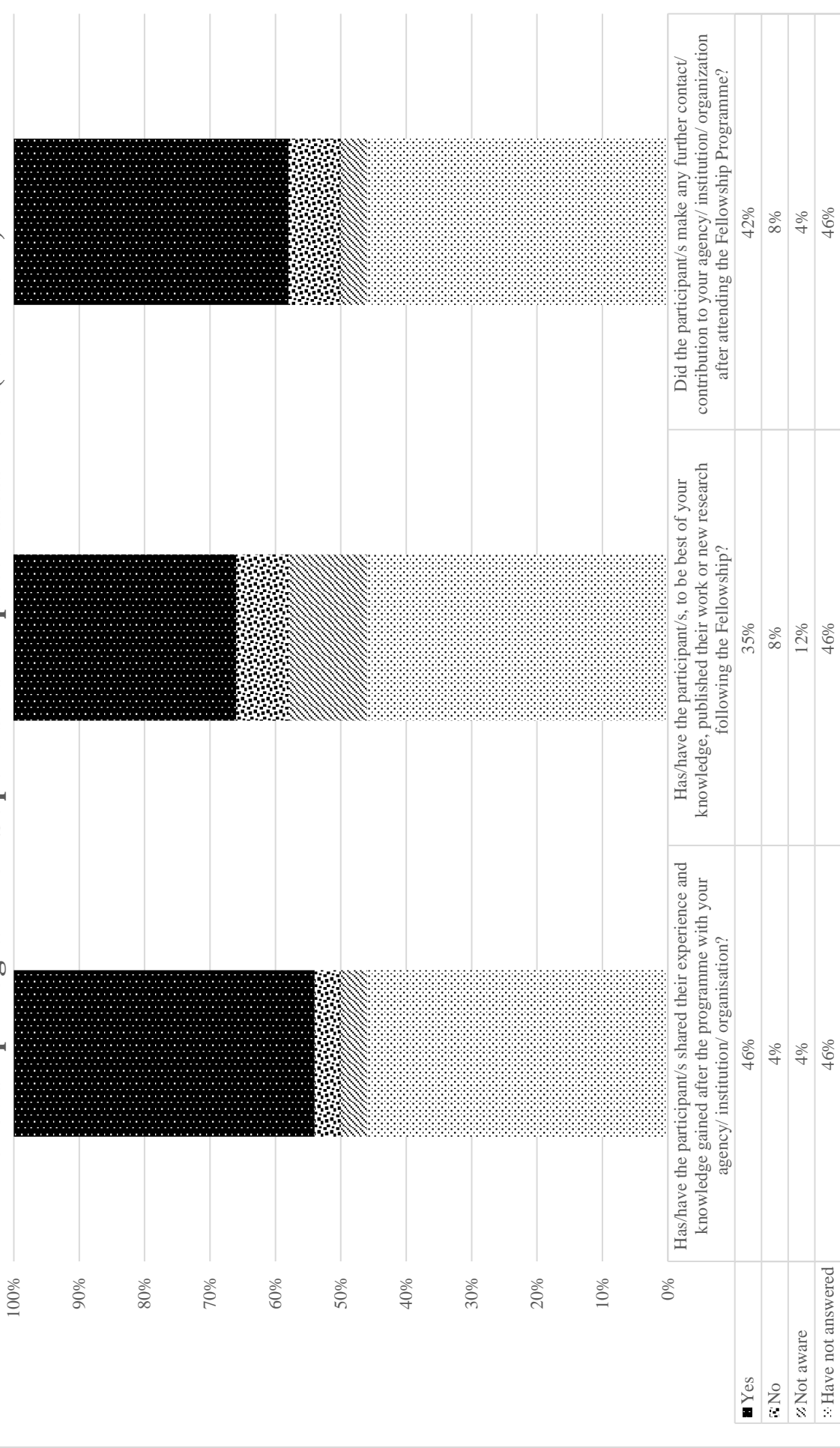




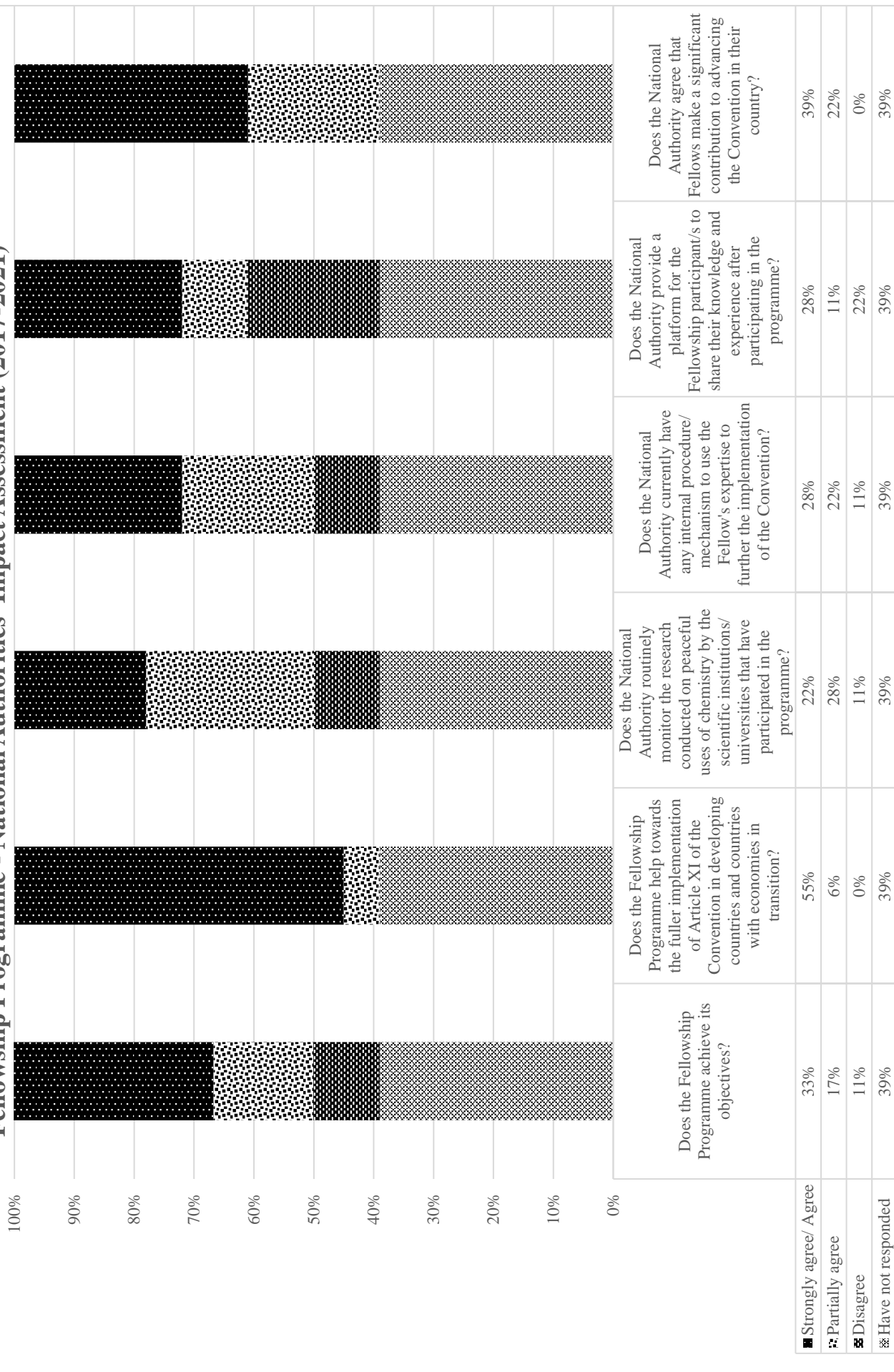
Fellowship Programme - Supervisors' Impact Assessment (2017-2021)



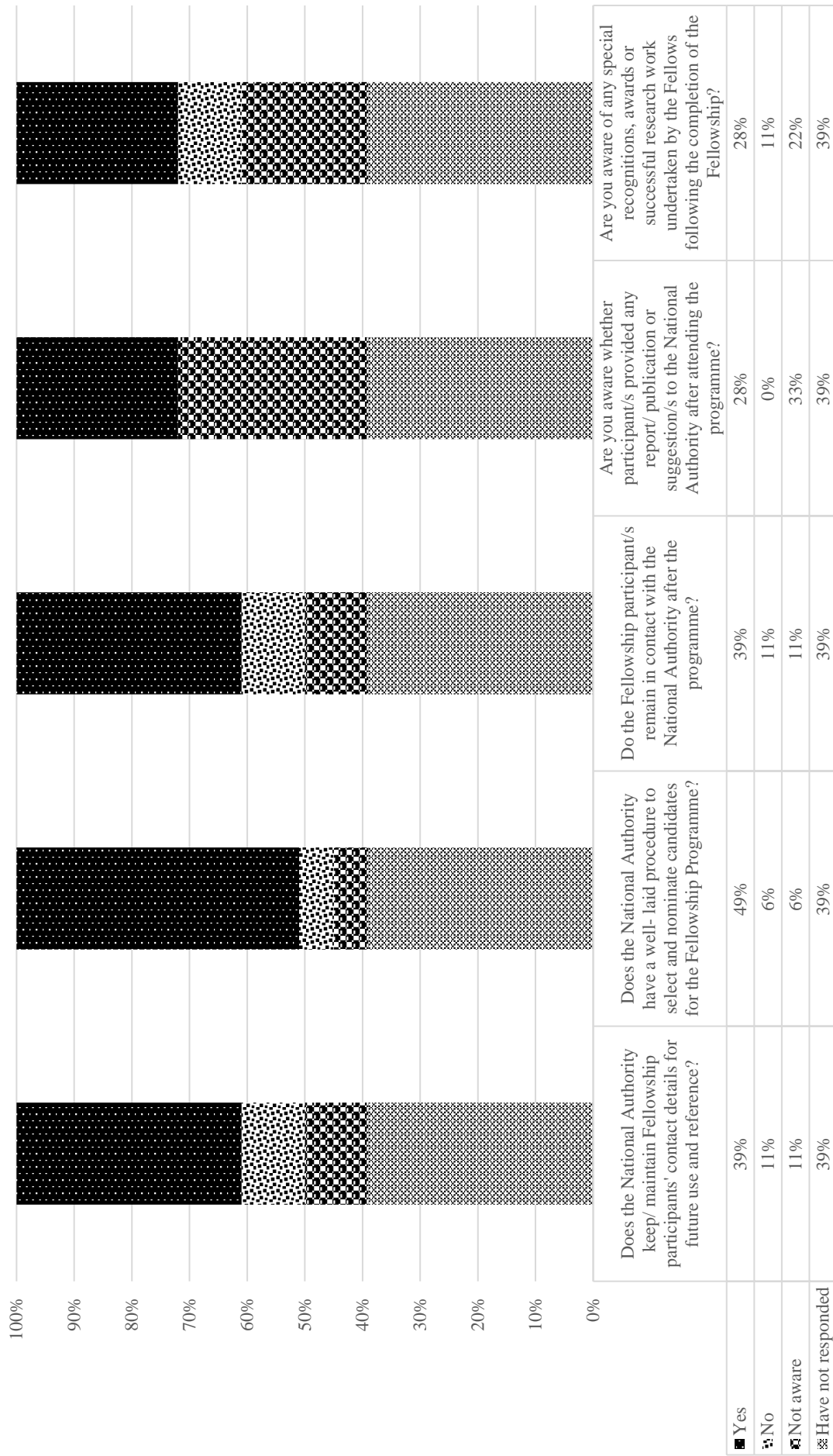
Fellowship Programme - Supervisors' Impact Assessment (2017-2021)



Fellowship Programme - National Authorities' Impact Assessment (2017-2021)



Fellowship Programme - National Authorities' Impact Assessment (2017-2021)



Annex 6

**SUMMARY OF MAIN ACTIVITIES UNDERTAKEN UNDER THE AUSPICES OF
 THE INTERNATIONAL COOPERATION BRANCH
 26 AUGUST 2021 TO 25 AUGUST 2022**

Programme/ Initiative	Date	Venue	Benefiting States Parties	Number of Participants	Total Number of Participants	Number of States Parties
Integrated Chemicals Management						
Associate Programme	28 July – 8 September 2022	Netherlands, United Kingdom of Great Britain and Northern Ireland	Argentina, Armenia, Belarus, Botswana, Brazil, Cambodia, Cameroon, Chile, Colombia, Cuba, Democratic Republic of the Congo, Ethiopia, Gambia, Ghana, India, Iraq, Kenya, Malawi, Mauritius, Niger, Nigeria, Pakistan, Philippines, Sierra Leone, Somalia, State of Palestine, Uganda, United Republic of Tanzania, Uzbekistan, Viet Nam	30	30	30
Chemical safety and security management	6 September – 8 October 2021	Online	Bangladesh, Brazil, Chile, Costa Rica, Cyprus, Ethiopia, Ghana, Grenada, India, Kenya, Malaysia, Maldives, Mauritania, Mauritius, Nigeria, Peru, Philippines, Seychelles, South Africa, Sri Lanka, Tunisia	24	285	21
	4 – 8 October 2021	Online	Bangladesh, Cambodia, China, India, Iraq, Malaysia, Myanmar, Pakistan, Qatar, Saudi Arabia, Sri Lanka, Uzbekistan	75		12
	4 October – 3 December 2021	Online	Argentina, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Costa Rica, Cuba, El Salvador, Honduras, Mexico, Nicaragua, Peru, Uruguay	15		13
	29 November 2021	Online	Iraq	25		1
	13 December 2021	Online	Bangladesh, Cambodia, Indonesia, Iran (Islamic Republic of), Malaysia, Myanmar, Pakistan, Philippines, Qatar, Saudi Arabia, Sri Lanka, United Arab Emirates, Viet Nam	24		13
	25 January 2022	Online	Bangladesh	25		1

Programme/ Initiative	Date	Venue	Benefiting States Parties	Number of Participants	Total Number of Participants	Number of States Parties
	4 – 6 April 2022	Wuppertal, Germany	Brazil, Germany, Kenya, Philippines, Sri Lanka, United Kingdom of Great Britain and Northern Ireland, United States of America	11		7
	10 – 12 May 2022	Harare, Zimbabwe	Ethiopia, Kenya, Mali, Mauritania, Mauritius, Niger, Nigeria, Seychelles, South Africa, Sudan, Togo, Tunisia, Uganda, Zimbabwe	35		14
	12 – 14 July 2022	Lima, Peru	Argentina, Bahamas, Brazil, Chile, Cuba, Guatemala, Panama, Peru, Saint Kitts and Nevis, Uruguay	36		10
	1 August – 7 October 2022	Online	Brazil, Chile, El Salvador, Guatemala, Honduras, Mexico, Panama, Peru	15		8
Enhancing Laboratory Capabilities						
Analytical skills development courses and proficiency testing training	23 – 27 August 2021	Online	Cameroon, Iraq, Kenya, Malaysia, Namibia, Nigeria, Pakistan, Tajikistan	9	240	8
	4 – 15 October 2021	Online	Armenia, Bangladesh, Belarus, Botswana, Cambodia, Chile, Côte d'Ivoire, El Salvador, Ghana, Iraq, Kenya, Lao People's Democratic Republic, Mauritius, Morocco, Nepal, Nicaragua, Nigeria, Pakistan, Peru, Philippines, Poland, Romania, Tunisia, Türkiye, Uganda, Zimbabwe	44		26
	22 November – 3 December 2021	Online	Argentina, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Costa Rica, Ecuador, Guatemala, Mexico, Peru, Uruguay	15		11
	23 – 25 November 2021	Online	Algeria, Benin, Botswana, Cameroon, Côte d'Ivoire, Ghana, Guinea-Bissau, Kenya, Lesotho, Malawi, Sierra Leone, Sudan, Tunisia, Uganda, United Republic of Tanzania, Zambia, Zimbabwe	17		17
	25 – 29 April 2022	Online	Algeria, Botswana, Burkina Faso, Cameroon, China, Iraq, Malaysia, Morocco, Namibia, Nigeria, Pakistan, Seychelles, Sierra Leone, Sri Lanka, Syrian Arab Republic, Thailand, Tunisia, Uganda	19		18
	17 – 19 May 2022	The Hague, Netherlands	Botswana, El Salvador, Ghana, Iraq, Lao People's Democratic Republic, Nicaragua, Pakistan, Poland, Romania, Zimbabwe	10		10

Programme/ Initiative	Date	Venue	Benefiting States Parties	Number of Participants	Total Number of Participants	Number of States Parties	
	23 May – 3 June 2022	Protechnik, South Africa	Algeria, Benin, Botswana, Burundi, Cameroon, Côte d'Ivoire, Ethiopia, Kenya, Lesotho, Malawi, Sierra Leone, South Africa, Tunisia, Uganda, United Republic of Tanzania, Zimbabwe	22		16	
	30 May – 10 June 2022	Online	Burundi, Cameroon, Ghana, Kenya, Malawi, Mali, Mauritius, Nigeria, Togo, Uganda, Zimbabwe	14		11	
	Supported through the voluntary contribution from the United Kingdom of Great Britain and Northern Ireland						
	13 – 17 December 2021	Online	Brazil, Chile	14		2	
	21 January – 23 March 2022	Online	Kenya, Nigeria	34		2	
	7 – 18 March 2022	Online	Brazil, Chile	14		2	
	7 April 2022	Online	Brazil, Chile, Finland, Germany, Kenya, Nigeria, Spain, United Kingdom of Great Britain and Northern Ireland	28		8	
Equipment Exchange	26 August 2021 – 25 August 2022	Germany	United Republic of Tanzania	7	7	1	
Chemical Knowledge Promotion and Exchange							
Article XI Workshop	10 November 2021	Online	Algeria, Argentina, Bangladesh, Belgium, Brazil, Cambodia, Cameroon, Canada, China, Costa Rica, Côte d'Ivoire, Croatia, Cuba, El Salvador, Ethiopia, Finland, France, Gambia, Georgia, Germany, Holy See, Honduras, India, Iran (Islamic Republic of), Iraq, Italy, Japan, Kenya, Malaysia, Mexico, Morocco, Myanmar, Nigeria, Pakistan, Paraguay, Peru, Philippines, Poland, Portugal, Romania, Saint Vincent and the Grenadines, Serbia, Slovakia, South Africa, Spain, State of Palestine, United Kingdom of Great Britain and Northern Ireland, United States of America	79	79	48	

Programme/ Initiative	Date	Venue	Benefiting States Parties	Number of Participants	Total Number of Participants	Number of States Parties
Conference Support Programme	26 August 2021 – 25 August 2022	Jordan, Italy	Brazil, Germany, Greece, France, India, Malaysia, Mexico, Morocco, Netherlands, Nigeria, Pakistan, Romania, Russian Federation, South Africa, Switzerland, Syrian Arab Republic, United States of America, Uzbekistan	95	95	18
Programme for Support of Research Project	26 August 2021 – 25 August 2022	Same as benefiting States Parties	Argentina, Brazil, Cameroon, Italy, Kenya, Nepal, Nigeria, North Macedonia, Malaysia, Pakistan, Poland, Serbia, South Africa, Türkiye, Uganda	35	35	15
Building a Knowledge Society	7 April 2022	Online	Bangladesh, Brazil, China, Guatemala, Honduras, India, Kenya, Malaysia, Maldives, Mauritius, Morocco, Nepal, Romania, Serbia, Sri Lanka, Togo, Trinidad and Tobago, United Kingdom of Great Britain and Northern Ireland	47	86	18
	28 April 2022	Online	Algeria, Bangladesh, Bolivia (Plurinational State of), China, Colombia, India, Iran (Islamic Republic of), Kenya, Malaysia, Mauritania, Morocco, Nicaragua, Nigeria, Pakistan, Saudi Arabia, Suriname	39		16
Fellowship Programme	26 August 2021 – 25 August 2022	Argentina, Finland, France, Germany, Italy, Mexico, Netherlands, Switzerland, United States of America	Argentina, Cameroon, Cuba, Jordan, Nigeria, Serbia, Uganda, Zimbabwe	14	14	8