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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 Ninety-Second 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. The reporting period for this report is 26 August 2018 to 25 August 2019.
2. During the reporting period, the Secretariat further enhanced its delivery of programmes and activities aimed at implementing Article XI of the Chemical Weapons Convention (hereinafter “the Convention”) 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 and in a cost-effective manner, and took into account the needs and priorities of the States Parties. The resources used were provided from the regular budget, as well as from voluntary contributions, both financial and in-kind, received for specific activities from several States Parties and entities.
4. During the reporting period, the Secretariat organised 27 capacity-building programmes (trainings, seminars, workshops) and supported 39 research projects, fellowships, and conferences. A total of 120 States Parties and 640 participants benefited from those activities.
5. In the area of integrated chemicals management, during the reporting period the Secretariat completed the nineteenth edition of the Associate Programme, benefiting 32 participants from 31 States Parties, and launched the twentieth edition (26 July to 27 September 2019) for 32 participants from 32 States Parties.
6. A special focus continued to be made on chemical safety and security management, with the organisation of 11 training courses and workshops benefiting 248 participants from 77 States Parties.
7. In other activities under the integrated chemicals management group of programmes, including the Executive Programme, Responsible Care[®] workshops, and green and sustainable chemistry, the Secretariat supported 79 participants from 59 States Parties.
8. In the area of enhancement of laboratory capabilities, the Secretariat delivered 11 analytical skills development courses, laboratory skills enhancement courses, and proficiency test training courses, benefiting 127 participants from 57 States Parties.
9. The chemical knowledge promotion and exchange group of programmes provided opportunities to further enhance networking and exchanges among scientific communities, academic institutions, chemical industry associations, non-governmental

organisations (NGOs), and regional and international institutions. The Secretariat sponsored nine scientific conferences in seven States Parties under the Conference Support Programme (benefiting 45 experts from 27 States Parties); funded 37 research projects in 20 States Parties under the Research Projects Support Programme; provided 11 fellowships for junior scientists from five States Parties under the Fellowship Programme; and sponsored the participation of 65 participants from 45 States Parties in various capacity-building events.

10. Additionally, 60 participants from 37 States Parties participated in an Article XI workshop, providing a platform to a wide range of chemistry experts from both developed and developing States Parties to share experience and knowledge.
11. In order to enhance the effectiveness and impact of the international cooperation programmes provided by the Secretariat to the States Parties, a cost-effective and results-based approach was implemented. Moreover, 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 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 the 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 needs assessments in the area of integrated chemicals management and enhancing laboratory capabilities. 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 chemical safety and security in their respective countries.
13. The evaluation and impact assessment approach and techniques were substantially streamlined 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 on 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 an impact assessment of the Associate Programme and analytical skills development courses.
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 the 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 2018 to 25 August 2019.
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 Initiative, analytical skills development courses, training courses for the OPCW proficiency tests, and the Chemical Safety and Security Management Programme.
21. During the period under review, the portfolio of international cooperation programmes under Article XI featured 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;
 - (vii) Executive Programme on integrated chemicals management;
 - (viii) Ports and maritime chemical safety and security management; and
 - (ix) Tools and guidance on chemical safety and security management;
 - (b) Enhancement of laboratory capabilities:
 - (i) Analytical skills development courses/proficiency test training;
 - (ii) Customs laboratory training;
 - (iii) Laboratory Twinning Initiative and laboratory assistance; and
 - (iv) Equipment Exchange Programme;
 - (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 chemical 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 to qualified chemists and chemical engineers requisite skills 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. To date, 20 editions of the Associate Programme have been attended by a total of 519 qualified personnel from 121 States Parties.
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 nineteenth edition of the Associate Programme was conducted from 3 August to 5 October 2018, with 31 participants from the following States Parties: Afghanistan, Algeria, Argentina, Armenia, Bangladesh, Brazil, Burundi, China, Ethiopia, the Gambia, Georgia, Guatemala, Iraq, Kenya, Malawi, Malaysia, Mauritius, Nigeria, Pakistan, Panama, Paraguay, Poland, Republic of Moldova, Saudi Arabia, Senegal, Sierra Leone, Sri Lanka, Tunisia, Uzbekistan, Venezuela (Bolivarian Republic of), and Zimbabwe. In addition, in furtherance of the objectives of the Programme to Strengthen Cooperation with Africa on the Chemical Weapons Convention (hereinafter “the Africa Programme”), 12 participants represented African States Parties. In terms of the support received, the following States Parties offered industrial attachments for this edition of the programme: China, the Czech Republic, Brazil, Denmark, Indonesia, Italy, Japan, Malaysia, Poland, Qatar, Saudi Arabia, Spain, Sri Lanka, and Switzerland.
27. As part of the Associate Programme, participants undertook a three-week university module organised by the University of Surrey in the United Kingdom of Great Britain and Northern Ireland. In addition, they undertook three-week industrial attachments in 16 modern chemical plants located in 14 States Parties. During the university module, the associates attended lectures on chemical engineering, where they immersed

themselves in simulated industry environments, including process plant operations and research and development facilities. During the industrial attachment, participants were mentored by professionals and received training at major chemical facilities to gain hands-on experience in chemical safety and security.

28. The following companies, with the support of the National Authorities of their respective countries, offered industrial attachments: Shanghai Lianheng Isocyanate Co. Ltd and Shanghai Fujia Fine Chemical Co. Ltd (China); Stachema CZ s.r.o. (Czech Republic); Oxiteno and Suatrans Emergência S.A. (Brazil); DuPont Nutrition and Health (Denmark); PT. Nippon Shokubai (Indonesia); DOW Italy and Isagro S.p.A. (Italy); Showa Denko K. K. and Ube Industries, Ltd. (Japan); SABIC (Saudi Arabia); Monsanto (M) Sdn.Bhd. (Malaysia); Grupa Azoty Zakłady Azotowe “Pulawy” (Poland); Qatar Petrochemical (Qatar); Camso Loadstar (Sri Lanka); Infrapark Baselland AG (Switzerland); and Ercros (Spain). Qatar and Saudi Arabia provided in-kind contributions for industry attachments at Qatari and Saudi Arabian companies. The programme also benefited from the continuous support of the World Customs Organization, the European Chemical Industry Council (CEFIC) (under its Responsible Care[®] initiative), the European Chemicals Agency, the European Association of Chemical Distributors, the Dutch Customs authorities (Douane), and the Port of Rotterdam.
29. Feedback received from the participants indicated their high appreciation of the training, which considerably upgraded their knowledge, technical skills, and experience in terms of chemistry and chemical and process engineering, with a focus on chemical safety management. Also, the training increased the participants’ knowledge of the Convention and of the mission and the role of the OPCW. Following the completion of the programme, participants serve as resource persons to their National Authorities and offer valuable support with respect to the implementation of the Convention at the national and regional levels. It is also noteworthy that two alumni of the Associate Programme have become OPCW staff members. Mr Evandro Nogueira of Brazil has been appointed as Director of the Inspectorate Division and Mr Milos Kristof of Slovakia as Head of the Declaration Validation and Evaluation (Chemical Demilitarisation) Section. Dr Austin Aluoch of Kenya, another former alumnus, continues to be a member of the OPCW Advisory Board on Education and Outreach. Dr Syeda Sultana Razia of Bangladesh has been a member of the OPCW Scientific Advisory Board since 2017.
30. The Alumni Association of the Associate Programme, established in 2012 and using a Facebook group page, continued to provide a highly interactive forum bringing together previous participants and allowing for sharing views, scientific information, and experiences in the field of chemistry. In addition, the association continued to constitute a reliable channel to receive the feedback of the members regarding the programme so as to ensure its continuous upgrade and to assess its impact over the years. The association also offers the opportunity of professional networking as participants can get together for joint projects and help each other with other professional opportunities. The alumni network offers an additional channel of communication with former participants and makes it possible to follow and support their initiatives with a view to disseminating the knowledge and experience gained during the Programme, including in the fields of education and outreach on the Convention and peaceful uses of chemistry.

31. The twentieth edition of the Associate Programme is under way (26 July to 29 September 2019), with 32 participants from the following 32 States Parties: Afghanistan, Algeria, Argentina, Botswana, Brazil, Burkina Faso, Burundi, Cameroon, Chile, China, Colombia, Costa Rica, Georgia, India, Jamaica, Malawi, Malaysia, Namibia, Nepal, Nigeria, Peru, Republic of Moldova, Senegal, Serbia, South Africa, Sri Lanka, Tajikistan, Togo, Trinidad and Tobago, Uganda, Uzbekistan, and Zimbabwe. The following States Parties offered industrial attachments for this edition of the programme: Argentina, Brazil, Chile, China, Finland, Germany, Indonesia, Italy, Poland, Spain, Malaysia, and Qatar. Details of this edition will be provided in the next Article XI progress report.

Chemical safety and security management, including needs assessment and forum on the peaceful uses of chemistry¹

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 Governments of Germany, Qatar, the Republic of Korea, 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.
33. During the reporting period, the Secretariat organised 11 capacity-building activities on chemical safety and security management, hosted by Algeria, Costa Rica, Ethiopia, Germany, the Netherlands, Qatar, the Republic of Korea, the Russian Federation, and Sri Lanka.
34. In view of further promoting the peaceful uses of chemistry, the Secretariat organised the “Forum on the Peaceful Uses of Chemistry: Potential Contribution of the OPCW to the Achievement of the United Nations Sustainable Development Goals (SDGs)”, in The Hague, the Netherlands on 23 October 2018. The forum was attended by 32 representatives of international and regional organisations, government agencies, chemical industries, academia, and relevant stakeholders from the following 28 States Parties: Algeria, Argentina, Azerbaijan, Belize, Bhutan, Belgium, Burkina Faso, China, Colombia, Ecuador, Germany, Indonesia, Italy, Kenya, Malaysia, Morocco, Myanmar, Panama, Pakistan, the Philippines, Poland, Sao Tome and Principe, Saudi Arabia, South Africa, Sri Lanka, the Sudan, Switzerland, and the United States of America.

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.

35. The forum provided for a dynamic discussion on the cutting-edge issues concerning the peaceful uses of chemistry. The overall objective was to create a platform to implement potential contributions that the OPCW could make towards the achievement of the SDGs, to discuss the synergies between existing OPCW programmes and the SDGs, and to identify potential partners and cooperation strategies within the framework of the SDGs, as they relate to topics that fall within the existing OPCW mandate. The forum also served as an opportunity to further enhance OPCW contribution in capacity building, while streamlining the implementation of Article XI to better serve the States Parties.
36. With financial support from the United States of America, the Secretariat, in cooperation with the National Authority of Sri Lanka, organised a South Asia regional chemical management workshop from 4 to 6 December 2018 in Colombo. The workshop was attended by 48 participants from the following 10 States Parties: Afghanistan, Bangladesh, Italy, India, Indonesia, Malaysia, Pakistan, the Philippines, Sri Lanka, and the United States of America. This programme focused on risk assessment methodologies and inventory management as they relate to the life cycle of hazardous chemicals.
37. The Secretariat organised the first edition of the workshop on developing tools and guidance on chemical safety and security management at the OPCW Headquarters in The Hague from 25 to 27 March 2019. The workshop was attended by 21 representatives from international and regional organisations (such as CEFIC, the Organisation for Economic Cooperation and Development, and the United Nations Environment Programme), and government agencies, chemical industries, academia, and other relevant stakeholders from the following States Parties: Algeria, Bangladesh, Belgium, Brazil, China, Costa Rica, Germany, Indonesia, Italy, the Niger, Pakistan, the Philippines, the Republic of Korea, Sri Lanka, the United Kingdom of Great Britain and Northern Ireland, and the United States of America. This workshop provided a platform for cross-sector partnerships of experts who pledged to develop a non-binding guidance document that will identify high-risk chemicals, and provided tools for chemical safety and security management in small and medium-sized chemical enterprises.
38. In cooperation with the National Authority of the Republic of Korea and thanks to a voluntary contribution made by that State Party, the Secretariat held the “Seoul Workshop on the Peaceful Development and Use of Chemistry for Member States of the OPCW in the Asia Region” from 30 October to 1 November 2018 in Seoul. The workshop was attended by 27 participants from the following 16 States Parties: Bangladesh, Cambodia, China, India, Indonesia, Iran (Islamic Republic of), Iraq, Italy, the Republic of Korea, Malaysia, Myanmar, Pakistan, the Philippines, Sri Lanka, Uzbekistan, and Viet Nam.
39. The workshop offered an opportunity for participants to consider new approaches in chemical safety and security management through scenario-based strategies. The participants also shared their experiences and discussed the approaches followed in their countries to ensure the safe and secure handling of chemicals, resulting in enhanced appreciation of the issues involved in chemical safety and security management.

40. With the aim of further promoting the peaceful use of chemistry, the Secretariat organised, jointly with the National Authority of Qatar and with the support of the Doha Regional Centre for CBRN² Training, a seminar on the Convention and chemical safety and security management. The seminar, funded through a voluntary contribution from the Government of Qatar, was held in Doha from 26 to 28 February 2019 and was attended by 66 representatives of chemical industry, chemical industry associations, National Authorities, and governments of the following 16 States Parties: Bangladesh, Belgium, China, Germany, India, Indonesia, Iran (Islamic Republic of), Jordan, Malaysia, Pakistan, the Philippines, Qatar, the Republic of Korea, Sri Lanka, Tajikistan, and Viet Nam. Participants in this programme focused on advanced process safety management, security risk assessment methodologies, and chemical threat reduction.
41. The Secretariat supported the Fourteenth Annual Chemical Weapons Convention Workshop, held at the Regional Arms Control Verification and Implementation Assistance Centre in Zagreb, Croatia, from 12 to 13 February 2019. The aim of this workshop, intended for representatives of National Authorities and relevant stakeholders (defence, emergency management agencies, civil defence, etc.), was to discuss relevant issues related to the Convention implementation in South-Eastern Europe. This year's workshop focused on the theme: "Chemical Safety and Security Management to Prevent Accidents and Incidents". Participants shared best practices and gained knowledge on the management of chemical hazards and risk reduction. Sixteen participants from Albania, Bosnia and Herzegovina, Croatia, North Macedonia, Montenegro, and Romania were in attendance.
42. A seminar on chemical safety and security management for African States Parties was held in Addis Ababa, Ethiopia, from 9 to 11 October 2018. This programme was intended for experts from the National Authorities and relevant stakeholders dealing with chemical safety and security management under the Responsible Care® programme. The programme equipped participants with knowledge in the area of chemical safety and security management, including chemical safety and security risk assessment, chemical threat assessment and vulnerability studies, and threat mitigation strategies. It was attended by 29 participants from 12 African States Parties, namely: Algeria, Burundi, Cameroon, Ethiopia, the Gambia, Kenya, Libya, Nigeria, South Africa, the Sudan, Uganda, and Zimbabwe.
43. In collaboration with the National Authority of Algeria, the Secretariat hosted the chemical safety and security workshop for African States Parties in Algiers from 23 to 25 June 2019. The seminar focused on the national framework for chemical safety and security management to facilitate oversight of high-risk chemical facilities. It also increased awareness on the importance of chemical safety and security policies and guidelines to prevent chemical accidents and the potential misuse of toxic chemicals in African countries. It was attended by 27 participants from 10 African States Parties, namely: Algeria, Burkina Faso, the Gambia, Malawi, Morocco, Namibia, Nigeria, Mauritius, the Sudan, and Uganda.

44. The Secretariat organised the chemical safety and security management programme for States Parties of the Group of Latin American and Caribbean States (GRULAC) in collaboration with the National Authority of Costa Rica and the University of Costa Rica in San José from 15 to 18 July 2019. The programme was intended to sensitise States Parties to the new approaches in chemical management that can be adopted in relation to chemical safety and security, with a particular focus on national policy and legal frameworks. It also aimed at promoting and sharing good practices among chemical industries. A table-top exercise on quantitative risk assessment and human factor analysis was also presented during the workshop. The event was attended by 31 participants from 16 GRULAC Member States, namely: Argentina, Barbados, Belize, Bolivia (Plurinational State of), Chile, Costa Rica, Cuba, El Salvador, Guatemala, Honduras, Nicaragua, Panama, Paraguay, Peru, Saint Vincent and the Grenadines, and Suriname.

Other initiatives (Executive Programme, Responsible Care[®] workshop, and green and sustainable chemistry)

45. The Secretariat, in collaboration with the United Kingdom of Great Britain and Northern Ireland, organised the second edition of the Executive Programme on Integrated Chemicals Management in London, from 24 to 27 September 2018. The conceptualisation of this programme is based on the outcome from the Article XI workshop in November 2016, where one of the ideas that emerged included “organising an Executive Programme under the Integrated Chemical Management Programme to accommodate senior experts of the Member States”. The Programme was attended by 16 representatives of government agencies, chemical industries, academia, and relevant stakeholders from the following 15 States Parties: Belgium, Bosnia and Herzegovina, Botswana, Chile, China, Grenada, Malaysia, Mozambique, Myanmar, Peru, Qatar, Saudi Arabia, Slovakia, Tajikistan, and Uganda.
46. From 15 to 19 October 2018 the Secretariat organised the third edition of the training workshop in Russian on best practices for developing the Responsible Care[®] programme for the chemical industry. The initiative, organised with support from the International Council of Chemical Industries (ICCA) and in cooperation with CEFIC (the coordinating agency for the Responsible Care[®] Programme in Europe) and the Russian Chemists Union, hosted 12 participants from the following 10 OPCW Member States: Armenia, Azerbaijan, Belarus, Bulgaria, Kazakhstan, Kyrgyzstan, Mongolia, the Republic of Moldova, Tajikistan, and Uzbekistan. The initiative aimed to promote the adoption of the Responsible Care[®] programme (an initiative of ICCA) in order to foster the sustainable management of chemicals, including safety and security, at chemical enterprises in the States Parties concerned. Accordingly, it helped to prepare the knowledge base in the States Parties that are not members of ICCA to help them consider joining the Responsible Care[®] programme in the future.
47. The “Workshop on Green and Sustainable Chemistry: Fostering Safety and Security through Innovation” was held in The Hague on 4 and 5 December 2018. The main purpose of the workshop was to facilitate discussions and dialogue among States Parties and relevant stakeholders (industry associations and academia, international and regional organisations) on green and sustainable chemistry and other initiatives and approaches for safer chemical processes, in line with the Convention’s goals of ensuring the safety of people and protecting the environment. The ultimate objective

was to explore areas of potential cooperation and partnership between States Parties towards achievement of the Convention's goals.

48. The workshop was attended by 20 experts and participants representing the following States Parties: Algeria, Bangladesh, Belgium, Brazil, Ecuador, France, Germany, India, Indonesia, Iraq, Italy, Malaysia, Paraguay, the Philippines, the Russian Federation, South Africa, the Sudan, and Thailand. The participants addressed different topics on the agenda and produced fruitful dialogue. They also identified some ideas on areas that could be explored for further potential collaboration between the various stakeholders. The main result of this exercise was the general recognition of the role of the OPCW in continuing to facilitate discussions among different stakeholders on different initiatives, including green and sustainable chemistry, in cooperation with partners and in accordance with its mandate.
49. Germany, through its voluntary contribution to the OPCW, organised two parallel courses on loss prevention and safety promotion in the chemical process industries at the University of Wuppertal. The two courses took place from 24 to 28 September 2018 and targeted Member States in Africa, Asia, as well as Latin America and the Caribbean. The participants, who had backgrounds in chemistry and chemical engineering and work experience in chemical or industrial manufacturing facilities, were from the following Member States: Argentina, Bangladesh, Bhutan, Brazil, Chad, Chile, Cuba, Ethiopia, Ghana, India, Jamaica, Kenya, Malaysia, Morocco, the Niger, Nigeria, the Philippines, Paraguay, Senegal, Sri Lanka, the Sudan, Togo, Tunisia, and Uganda. The two courses included lectures on the role of human factors and an introduction to risk analysis methods, discussions on process control engineering and safety management, as well as emergency planning, risk, and disaster communication. A visit to an industry site was also undertaken, along with practical exercises at a laboratory and at the University of Wuppertal's mini-plant, which was specially built for the courses.

Enhancement of laboratory capabilities

50. The Secretariat 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 Initiative, proficiency test trainings, customs laboratory training, and the Equipment Exchange Programme. A total 127 participants from the following 57 States Parties benefited from these programmes: Algeria, Argentina, Bangladesh, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cameroon, Chile, China, Colombia, Costa Rica, Côte d'Ivoire, Cuba, the Democratic Republic of the Congo, Ecuador, Ethiopia, Germany, Ghana, Grenada, Guatemala, Iraq, Ireland, Kazakhstan, Kenya, Lesotho, Luxembourg, Madagascar, Malawi, Mali, Mauritius, Mexico, Morocco, Nigeria, Oman, Panama, Paraguay, Peru, the Philippines, the Republic of Moldova, Senegal, Serbia, Slovakia, South Africa, Sri Lanka, the Sudan, Togo, Tunisia, Uganda, Ukraine, the United Republic of Tanzania, Uruguay, Venezuela (Bolivarian Republic of), Viet Nam, Zambia, and Zimbabwe.

51. The analytical skills development courses are two-week courses 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.
52. 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 then are given demonstrations and practical exercises in these techniques. The courses also cover the theoretical aspects of LC and GC, LC-MS, GC-MS, NMR, quality assurance, and instrument maintenance.
53. In addition to the established programmes in the area of enhancement of laboratory capabilities, the Secretariat has continued the Laboratory Twinning Initiative, which is aimed at improving the technical competencies of laboratories in States Parties whose economies are either developing or in transition for participation in the OPCW Proficiency Tests. This initiative is based on the provision of mentorship and exchange of knowledge from more advanced laboratories, which preferably already hold OPCW designated status. The Secretariat has received a number of expressions of interest for participation in the initiative. There has been progress in the development of a twinning project between Protechnik Laboratories in South Africa (receiving assistance) and the Netherlands Organisation for Applied Scientific Research (providing assistance), for which a letter of intent was signed by both States Parties on the margins of the Twenty-Third Session of the Conference. Additionally, a project has been launched under the voluntary contribution of the United Kingdom of Great Britain and Northern Ireland to identify and enhance the capacity of laboratories from the GRULAC and Africa regions that are seeking OPCW designation.

Analytical skills development courses/basic proficiency test training

54. During the review period, 11 analytical chemistry courses were organised for the benefit of 127 participants from 57 States Parties. These included one analytical skills development course at the Indian Institute of Chemical Technology (IICT) in Hyderabad, India; two laboratory skills enhancement courses at the Finnish Institute for Verification of the Chemical Weapons Convention (VERIFIN) in Helsinki, Finland; two basic proficiency testing training courses at the OPCW Laboratory in Rijswijk, the Netherlands; one analytical chemistry course at Protechnik Laboratories

- in Pretoria, South Africa; one analytical chemistry course in Tunisia for French-speaking African countries; one basic analytical chemistry course for women chemists; one course for analytical chemists from laboratories supporting customs services; and one course at the OPCW Laboratory on the microsynthesis of chemicals relevant to the Convention in the framework of OPCW proficiency testing.
55. The analytical skills development course at the IICT in India was conducted from 3 to 14 December 2018 and was attended by 19 participants from the following States Parties: Algeria, Bangladesh, Brazil, Chile, Costa Rica, Ethiopia, Mexico, Morocco, Nigeria, the Philippines, the Republic of Moldova, Serbia, Sri Lanka, the Sudan, Tunisia, Uganda, Viet Nam, and Zimbabwe.
 56. The course at VERIFIN from 10 to 21 September 2018 concerned QMS and laboratory quality management techniques and hosted 12 participants from Argentina, Costa Rica, Cuba, Ghana, Kazakhstan, Morocco, Nigeria, Sri Lanka, Tunisia, Ukraine, Uganda, and Zimbabwe.
 57. As a result of the high demand for training in advanced analytical techniques from Spanish-speaking personnel from laboratories in the GRULAC region, the Secretariat, with the active support of the National Authority of Spain, organised the eighth and ninth editions of the “Course on the Analysis of Chemicals Related to the Chemical Weapons Convention in the Framework of OPCW Proficiency Testing” at the Laboratorio de Verificación para las Armas Químicas (LAVEMA), Spain, from 22 November to 5 December 2018 and from 3 to 14 June 2019, respectively. The 2018 course accommodated 15 participants from the GRULAC Member States of Argentina, Brazil, Costa Rica, Cuba, Ecuador, Guatemala, Mexico, Panama, Peru, Paraguay, and Uruguay, with two participants from Spain. The 2019 edition was attended by 15 participants from Argentina, Brazil, Chile, Colombia, Costa Rica, Cuba, Guatemala, Panama, Paraguay, Peru, Uruguay, and Venezuela (Bolivarian Republic of), with one participant from Spain. The course targeted both the laboratories that are active or plan to become active in the analysis of chemicals related to the Convention, and those that are participating or intend to participate in OPCW proficiency testing.
 58. Under the Africa Programme and in collaboration with Protechnik Laboratories, the analytical chemistry course in Pretoria, South Africa was held from 13 to 24 May 2019. Sponsorship was provided for 22 participants from Algeria, Burkina Faso, Cameroon, Kenya, Lesotho, Malawi, Morocco, Nigeria, South Africa, the Sudan, Uganda, the United Republic of Tanzania, Zambia, and Zimbabwe.
 59. From 16 to 26 October 2018 Tunisia hosted an analytical chemistry course in Tunis for French-speaking African countries. The course was aimed at assisting qualified personnel (analytical chemists) from Africa in acquiring the necessary analytical skills related to the implementation of the Convention. The course equipped the participants with knowledge and skills on the analysis of Convention-related chemicals using GC-MS, and on equipment maintenance and sample collection and storage. The course was attended by 15 participants from 13 French-speaking African Member States, namely: Algeria, Burkina Faso, Burundi, Cameroon, Côte d’Ivoire, the Democratic Republic of the Congo, Madagascar, Mali, Mauritius, Morocco, Tunisia, Senegal, and Togo. Funding was provided through a voluntary contribution from the European Union.

60. The fourth edition of the basic analytical chemistry course for women chemists was organised at the OPCW Laboratory, in Rijswijk, the Netherlands from 25 to 28 June 2019. It was attended by 10 representatives from academic institutions and government offices from Cuba, Ecuador, Grenada, Iraq, Malawi, Morocco, Nigeria, Oman, Slovakia, and Ukraine. The course was aimed at assisting qualified women analytical chemists from Member States of the OPCW whose economies are developing or in transition in acquiring further knowledge and experience, specifically as related to the analysis of chemicals related to the Convention, and to facilitate the adoption of good laboratory practices and quality standards.
61. Furthermore, in the series of courses launched in May 2015 to train laboratories seeking to successfully pass the OPCW proficiency tests and subsequently attain OPCW designated status, the OPCW conducted the sixth, seventh and eighth international laboratory training courses at its laboratory facility in Rijswijk. This programme is aimed at expanding the global network of partner laboratories that can perform the analysis of samples under the OPCW's verification regime. These training programmes were conducted from 3 to 7 September 2018 (for three laboratory specialists from Algeria); from 29 October to 2 November 2018 (for five African specialists, from Algeria, Botswana, Kenya, Nigeria, and Uganda); and from 8 to 12 April 2019 (for five specialists from Qatar, through a voluntary contribution from that State Party). During a week-long course, participants received instruction on the techniques and processes required for passing the stringent OPCW proficiency tests.
62. The Secretariat organised the third edition of the course for analytical chemists from laboratories supporting customs services at the OPCW Laboratory in Rijswijk, from 8 to 12 July 2019. The course was intended for analytical chemists from laboratories that support, or plan to support, customs services or offices in States Parties. Ten participants from the following 10 States Parties took part in the course: Argentina, Bulgaria, China, Costa Rica, Germany, Ireland, Luxembourg, Madagascar, the United Republic of Tanzania, and Zimbabwe.

Equipment Exchange Programme

63. The Equipment Exchange Programme aims to support the transfer of used, but still functional, equipment from institutions in one State Party to those in another. During the reporting period, the Secretariat received one equipment request, donated one fume hood, and facilitated one equipment transfer/donation to Ethiopia. As this programme is mainly based on donations of equipment by States Parties, the Secretariat maintains continuous contact with potential donors to encourage donations.

Chemical knowledge promotion and exchange

64. The Secretariat has continued to promote networking and exchange among scientific communities, 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", including the Women in Chemistry Symposium and the Policy and Diplomacy for Scientists workshops. 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

65. The Fellowship Programme assists scientists and engineers from States Parties whose economies are developing or in transition to gain experience by working for a limited period in more advanced research laboratories and facilities in other States Parties. 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.
66. Eleven fellowships were sponsored during the period under review (see Annex 2). In addition, a number of fellowships are expected to start later in 2019.

Programme for Support of Research Projects

67. 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 International Foundation for Science (IFS) in Stockholm, Sweden to co-fund projects from developing countries.
68. During the reporting period, the OPCW approved direct funding for five new research projects from Argentina, Brazil, India, North Macedonia, and Turkey. The Secretariat continued to support 19 other projects undertaken by nationals of Argentina (2), Brazil (2), Indonesia, Italy (2), Kenya, Malaysia (3), Pakistan, Serbia (3), South Africa, Tunisia, Uganda, and Uruguay, all of which were ongoing as at the cut-off date for this report. Two projects from Brazil and Turkey were completed within the reporting period. Details of the above-mentioned directly funded projects are provided in Annex 3.
69. Collaboration with the IFS to jointly fund research projects continued with the support of 20 new projects from the following 12 States Parties: Bangladesh, Bolivia (Plurinational State of), Burkina Faso (2), Cameroon, Côte d'Ivoire, Kenya (2), Nepal, Nigeria (2), Pakistan (3), Tunisia, Uganda, and Viet Nam (4). These projects were approved by the Review Committee³ consecutively at its thirtieth and thirty-first meetings on 26 July 2019 and 9 November 2018, respectively. Details of the new, jointly funded projects are given in Annex 4.

Conference Support Programme

70. 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

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The selection procedure for the Programme for Support of Research Projects involves a Review Committee that assesses the merits of the research proposals submitted for support.

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.

71. During the period under review, nine events in seven States Parties were supported in order to facilitate the exchange of scientific and technical information in areas relating to the peaceful use of chemistry. A list of these conferences and the countries of sponsored participants is provided in Annex 1.

Empowering women in chemistry

72. 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. Under this initiative, the Secretariat organised the fourth edition of the Symposium on Women in Chemistry at OPCW Headquarters on 24 June 2019. The symposium attracted 60 participants from 45 countries. In addition, under the Women's Leadership Skills Programme, the Government of Canada provided sponsorship for the attendance of participants from Iraq, Nigeria, and Peru.

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

73. 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. On 1 July 2019 in The Hague, the Secretariat organised the fourth edition of the workshop on review and evaluation of the components of an agreed framework for the full implementation of Article XI. The workshop hosted 60 participants from the following 36 States Parties: Algeria, Argentina, Australia, Bangladesh, Belgium, Brazil, Cameroon, Chile, China, Colombia, Costa Rica, Cuba, France, Germany, Guatemala, India, Indonesia, Iran (Islamic Republic of), Japan, Kenya, Morocco, the Netherlands, Nicaragua, Nigeria, Panama, Peru, Poland, the Republic of Korea, Serbia, South Africa, the State of Palestine, Uganda, the United Kingdom of Great Britain and Northern Ireland, the United States of America, Uruguay, and Venezuela (Bolivarian Republic of).
74. The participants had an opportunity to share their countries' needs in relation to Article XI and concluded that the object and purpose of the Convention cannot be fully realised if the economic and technological development of States Parties are neglected. The international cooperation programmes and activities related to capacity building and education and outreach benefit States Parties in such a way as to also to facilitate their scientific and economic development.

ENHANCING THE EFFECTIVENESS OF OPCW INTERNATIONAL COOPERATION PROGRAMMES

75. 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 (established in 2012), alumni networks have been established for other programmes such as the Chemical Safety and Security 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.
76. During the reporting period, the Secretariat launched the fourth 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 22 States Parties have provided their inputs: Australia, Bangladesh, Burundi, Chile, China, Colombia, Costa Rica, Cuba, Ecuador, France, Georgia, Haiti, Jordan, Kenya, Madagascar, Mauritius, Mexico, Poland, Turkey, the United Arab Emirates, the United States of America, and Zambia.
77. The Secretariat also supported the facilitator for Article XI issues, Mr Junaid Sadiq, in organising a series of informal consultations to provide the States Parties with updates on the progress of the capacity-building programmes offered by the Secretariat in promoting the peaceful uses of chemistry.
78. Furthermore, to enhance the effectiveness of all 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.
79. For example, the Associate Programme has five distinct components, each of which is evaluated by both participants and tutors and, for the industry segment, by mentors in the hosting chemical industries. Accordingly, all components are comprehensively and fully assessed as part of a 360-degree evaluation mechanism. Based on the feedback received, the Programme continues to be upgraded through a continuous review of the various components of the training curriculum. The Programme will continue to be revised in order to optimise the invested resources and increase the relevance of content and the efficiency of delivery.
80. Programme delivery and the contribution of participants are also evaluated in special meetings and other interactions with the various stakeholders. The evaluation meetings bring together the various programme stakeholders as well as representatives of States Parties to review programme content and structure. Feedback from both the participants (regarding the various segments of the Programme) and from the University of Surrey (where the university module is held) is shared during the

meeting. The outcome of the evaluation is also presented to States Parties during National Authorities' meetings and informal Article XI consultations.

81. 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.
82. 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.
83. 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.
84. In terms of 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. As the Associate Programme is the flagship programme of the OPCW, a special request for specific feedback is made to National Authorities. Feedback and evaluation are ongoing processes, taking place during the programme delivery and post-delivery phases.
85. In light of the evaluation of the impact of international cooperation programmes, the Secretariat conducted pilot evaluations of two programmes, focusing on their impact on participants, their institutions, and States Parties. The programmes evaluated included the Associate Programme and analytical skills development courses from the period 2015 to 2018. This evaluation was performed in order to assess the growing importance of international cooperation programmes and the benefit to States Parties after participating in them.
86. The impact assessment 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 participants in the programmes, participants' supervisors, and National Authorities.
87. The responses received as part of this evaluation highlighted the impact of the programme on the participants, as well as on their respective institutions. Most of the participants were able to use the experience and knowledge that they gained from the programmes in their respective working environments. Participants also indicated an improvement in their capabilities for the performance on their tasks and a direct impact on their institutions. Participants also shared the information with other colleagues and in their professional environment. In many instances, participants were assigned more active roles and were subsequently promoted to higher positions in

their respective hierarchies. Some participants, however, indicated that they had faced challenges in applying the knowledge they had gained, owing for instance to the absence of functioning equipment or a lack of financial support.

88. Feedback is still being analysed while levels of participation are low, which will not allow for a clear picture on the impacts. Overall, the feedback has been positive in regard to the content of the courses and some follow-up activities. One impact of the programmes is that they create mutual accountability among the stakeholders in the States Parties and encourage them to work together towards achieving the objectives of national implementation of the Convention. The programmes also create a platform for cooperation and mutual understanding between relevant stakeholders in regard to the roles and responsibilities in supporting the National Authorities.

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

89. Throughout the reporting period, the Secretariat continued to support the facilitator on Article XI issues and 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.
90. In order to enhance communication among all stakeholders, information about programmes, activities, and outcomes relating to the Convention, especially 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

91. The activities listed above have been funded from within the resources of the annual Programme and Budget of the OPCW. In addition, voluntary contributions were received from States Parties for specific events.

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

92. 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.
93. During the Ninety-First Session of the Council, held from 9 to 12 July 2019, the Secretariat made 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 2018 TO 25 AUGUST 2019**

	Conference Title	Location	Duration	State Party of Sponsored Participants	Number of Sponsored Participants
1.	CSCM World Congress on CBRNe Science & Consequence Management (CSCM 2018)	Cavtat, Croatia	2–6 September 2018	Georgia, India, Iran (Islamic Republic of), Iraq, Russian Federation, and Turkey	6
2.	International Conference on Advances in Materials Science (ICAMS)	Kerala, India	24–25 October 2018	Bangladesh and South Africa	2
3.	Loss Prevention 2019 (TU Delft)	Delft, the Netherlands	16–19 June 2019	China	3
4.	53rd Course of the International School of Crystallography “Magnetic Crystallography”	Erice, Italy	1–8 June 2019	Argentina and India (2)	3
5.	54th Course of the International School of Crystallography “Cryo 3D Electron Microscopy”	Erice, Italy	1–8 June 2019	Argentina, Brazil, India, and Poland	4

	Conference Title	Location	Duration	State Party of Sponsored Participants	Number of Sponsored Participants
6.	14th International Symposium on Macrocyclic and Supramolecular Chemistry (ISMSC 2019)	Lecce, Italy	2–6 June 2019	China, Pakistan, India, Singapore, and South Africa	5
7.	IUPAC for Africa: Postgraduate Summer School on Green Chemistry	Dar es Salaam, United Republic of Tanzania	12–19 May 2019	Ghana, Nigeria, South Africa, and Uganda	4
8.	17th E-SALAMA Conference and Training Workshop	Gaborone, Botswana	10–14 June 2019	Kenya (2), Lesotho, Malawi, South Africa (2), Sudan, Uganda, United Republic of Tanzania, Zambia, and Zimbabwe	11
9.	39th International Symposium on Halogenated Persistent Organic Pollutants (DIOXIN 2019)	Kyoto, Japan	25–30 August 2019	Brazil, Ghana, India, Indonesia, Myanmar, and South Africa	6

Annex 2

**PROJECTS CONDUCTED UNDER THE FELLOWSHIP PROGRAMME
26 AUGUST 2018 TO 25 AUGUST 2019**

	Title of Project	Location of Fellowship	Duration	State Party of Fellow
1.	Synthesis of compounds related to the precursors, degradation and by products CW- Agents	Spiez, Switzerland	3 September–30 November 2018	Brazil
2.	Heterogeneous silver catalysts for selective oxidation of alcohols using molecular oxygen oxidant	Lund, Sweden	17 September–14 December 2018	Uganda
3.	Spectrometric Determination of Orthophosphate Anion Molybdenum Blue using Sodium Thiosulphate as reducing agent	KwaZulu-Natal, South Africa	8 October–21 December 2018	Uganda
4.	Fellowship for Synthesis Specialist	VERIFIN, Helsinki, Finland	8 October 2018–31 March 2019	Malaysia
5.	Antibacterial activity and phytochemical screening of the leaf extract of <i>solenostemon latifolius</i> hoschst ex. benth	Bonn, Germany	11 October–29 December 2018	Uganda
6.	Antiinfective agents from cyanobacteria derived marine bacteria	Saarbrücken, Germany	19 November 2018–17 May 2019	Kenya
7.	Carbon dioxide-epoxide copolymerization using supported zinc catalysts	Lund, Sweden	3 March–31 May 2019	Uganda
8.	Development of new anticancer agents, molecular design, synthesis, test	Cluj-Napoca, Romania	3 May–31 July 2019	Cameroon
9.	Spectrometric Determination of Orthophosphate Anion Molybdenum Blue using Sodium Thiosulphate as reducing agent – Phase II	KwaZulu-Natal, South Africa	15 April–12 July 2019	Uganda
10.	Cameroonian Medicinal plants: Cytotoxic Alkaloids in the battle against cancer	Paris, France	16 May–31 October 2019	Cameroon
11.	Fellowship for Analytical Chemistry Specialist	VERIFIN, Helsinki, Finland		

Annex 3

RESEARCH PROJECTS FUNDED DIRECTLY BY THE OPCW 26 AUGUST 2018 TO 25 AUGUST 2019

	Title	State Party of Researcher	Status
1.	Characterisation of Bioactive Phytochemicals from Winemaking By-products of Argentina: Exploring Stilbenes and Lipid-soluble Compounds by Using Metabolomics Tools	Argentina	Approved
2.	Development and characterization of nanostructured surfaces, oriented to recovering and monitoring heavy metals in industrial process waters	Argentina	Ongoing
3.	Polyethylene mulching in agriculture: the interaction between plastic, soil, pesticides and phthalic esters	Argentina	Ongoing
4.	Development of Fast Analytical Methods for Identification of Toxic Chemicals Using a Mobile GC-MS	Brazil	Ongoing
5.	Development of polymer-based nanostructured sensors for detection of hydrogen sulfide (h ₂ s)	Brazil	Ongoing
6.	Synthesis of Novel Molecules and Evaluation of Their Interaction with Native and Organophosphorus-Inhibited Cholinesterases	Brazil	Completed
7.	Research and development of novel sensors and biosensors based on nanocarbons for the detection of chemical agents used as weapons, by using pulsed laser deposition technique	Brazil	Approved
8.	Clean route of synthesis of piezo-photocatalyst material for degradation of organic pollutants	India	Approved
9.	Synthesis of Environmentally Friendly Polyurethane Non-isocyanate Based on Vegetable Oil	Indonesia	Ongoing
10.	Chemistry Beyond Chlorine: Dialkyl Carbonates for Biomass Upgrading and Synthesis of Heterocycles	Italy	Ongoing
11.	Application of miniaturised sensors and sampler to remotely controlled mini Aerial vehicles (payload less than 25kg), a new pathway for the survey of critical areas	Italy	Ongoing
12.	Design and Fabrication of Chemo-sensor for food-borne mycotoxins as Potential Chemical Warfare Agents	Kenya	Ongoing
13.	Risk analysis of natural toxic pyrrolizidine alkaloids in the food chain: development, validation, and application of HPLC/MSn Methods	North Macedonia	Approved
14.	Towards Oxygen Tolerant Cross-Coupling Reactions in Aqueous Media for the Developing World in the Interest of Safer Molecular Electronics: An Attempt in Reducing Solvents and Toxic Chemicals Dependency	Malaysia	Ongoing
15.	Development and application of new alginate encapsulated multiwall carbon nanotube micro-beads for extraction of lead ions from water samples	Malaysia	Ongoing
16.	Palm oil activated carbon-based nanocomposite as magnetic solid phase extraction sorbents for rapid and efficient separation of polar organochlorine pesticides	Malaysia	Ongoing

	Title	State Party of Researcher	Status
17.	Chemical fingerprinting of the poisonous plants of Pakistani origin by mass spectrometric methods	Pakistan	Ongoing
18.	Diagnostic of Schizophrenia and Bipolar Disorder by NMR-based Metabolomics and Lipidomics	Serbia	Ongoing
19.	Detection of herbs and dietary supplements fraud using metabolomics approach	Serbia	Ongoing
20.	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
21.	Monitoring the Distribution of Emerging Micro Pollutants in Food Crops Irrigated with Reclaimed Water	South Africa	Ongoing
22.	Development of a robust field arsenic speciation method to separate lewisite compound using an GC/ICP/MS	Tunisia	Ongoing
23.	A Novel Approach to Chlorine Exposure: Raman Spectroscopy	Turkey	Completed
24.	A Novel Approach to Chlorine Exposure: Raman Spectroscopy Part II	Turkey	Approved
25.	Advancement of Safe Natural Products for the Treatment of Malaria	Uganda	Ongoing
26.	Turning Industrial Waste into Value-Added Chemical Products	Uruguay	Ongoing

Annex 4

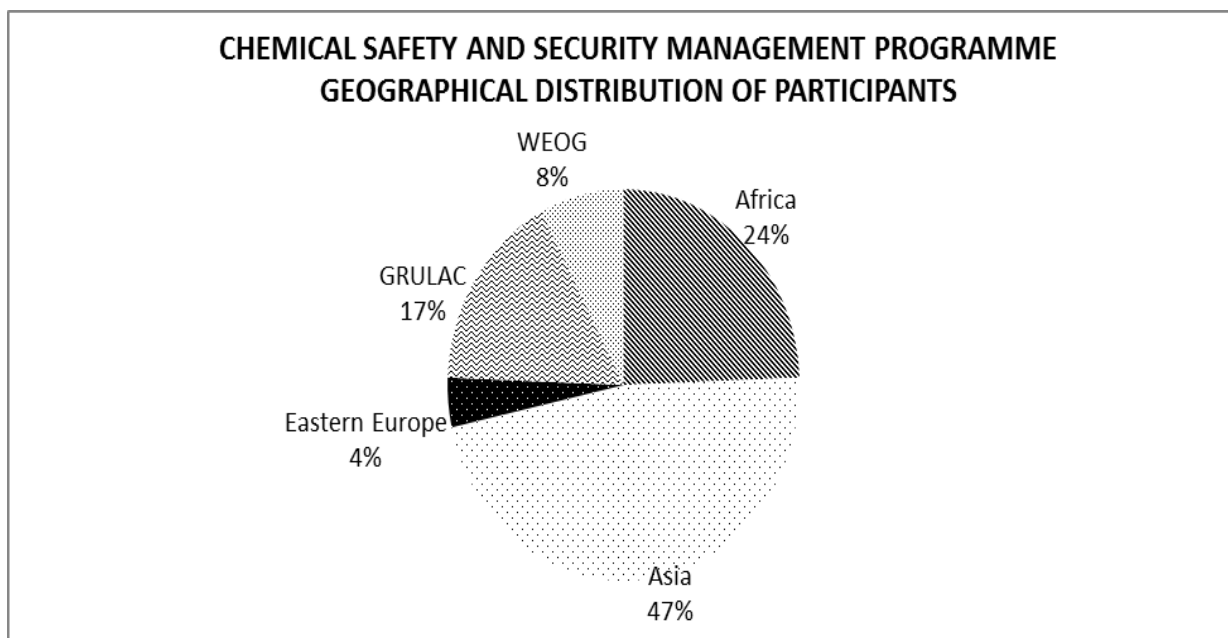
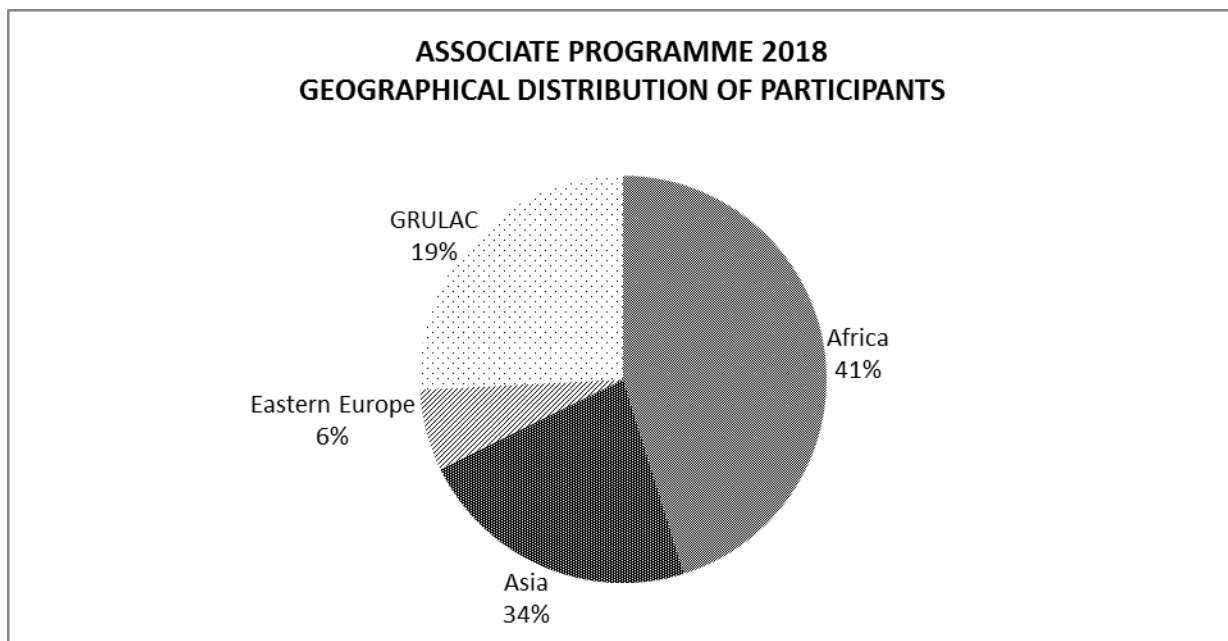
**RESEARCH PROJECTS FUNDED JOINTLY WITH
THE INTERNATIONAL FOUNDATION FOR SCIENCE
26 AUGUST 2018 TO 25 AUGUST 2019**

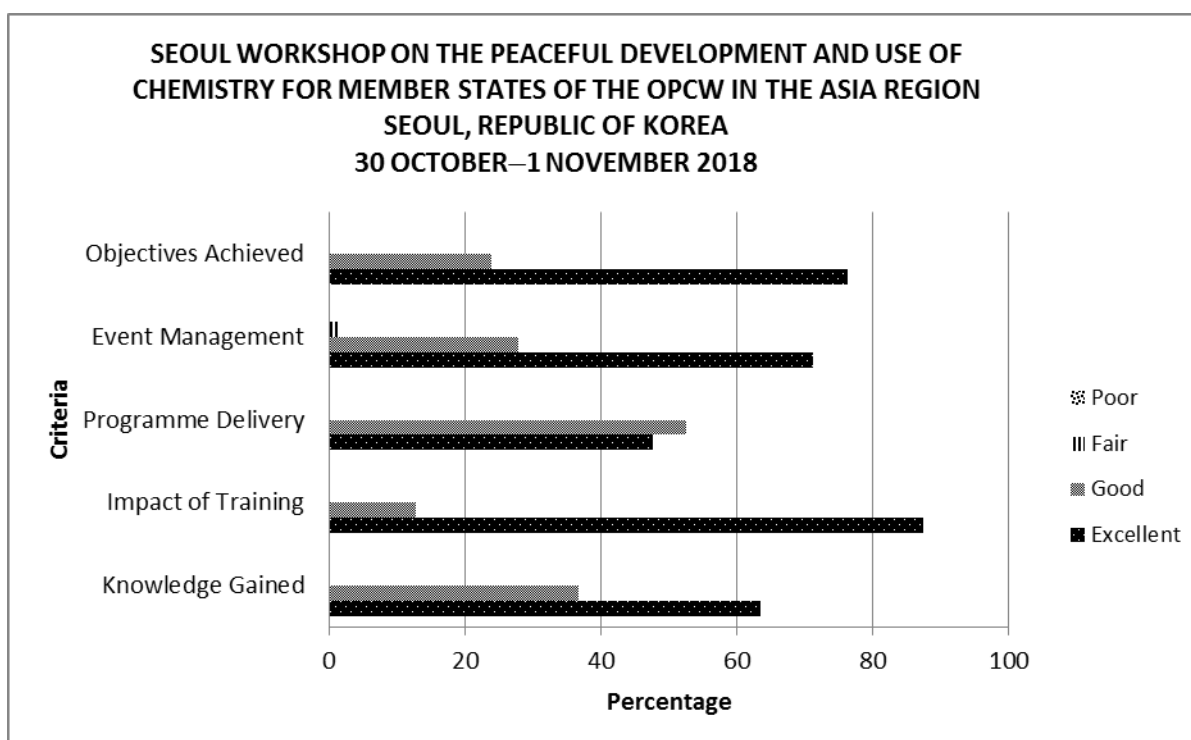
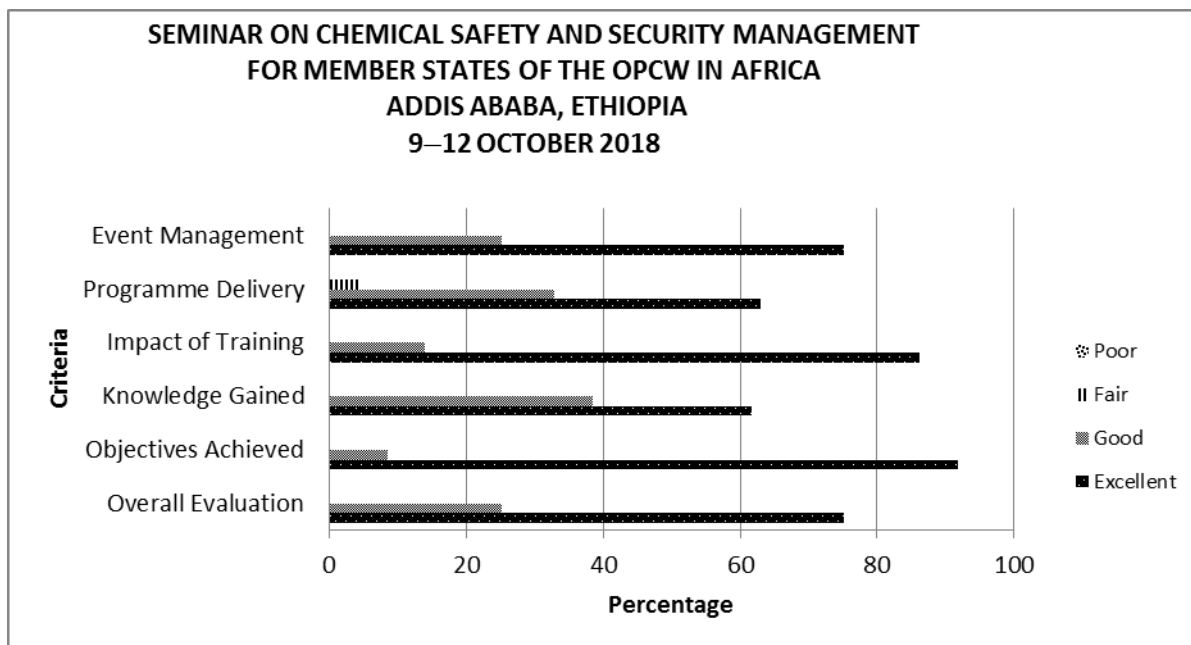
	Title	State Party of Researcher
1.	Quantitative risk assessment of organochlorine compound (Dichloro Diphenyl Trichloroethane, DDT) contaminated dried fish consumption in the coastal area of Bangladesh	Bangladesh
2.	Evaluation of biological activity of alkaloids in <i>Lupinus mutabilis</i> as metabolic regulators and its role in c-HDL/LDL levels and insulin secretion	Bolivia (Plurinational State of)
3.	Effet des amendements organiques sur le devenir des métaux lourds dans les sols agricoles au Burkina Faso	Burkina Faso
4.	Effets de la composition et de l'humidité sur la dégradation des pesticides dans un biobed au Burkina Faso	Burkina Faso
5.	A disposable screen printed electrodes modified with silver nanoparticles: application for electroquantification of arsenic (III) in rice	Cameroon
6.	Biodiversité de la faune édaphique et caractérisation des contaminants de la matrice biologique des sols de la forêt humide du Banco, Abidjan, Côte d'Ivoire	Côte d'Ivoire
7.	Examining the role of bacteria in mediating oviposition responses of malaria mosquitoes	Kenya
8.	Assessment of selected polybrominated diphenyl ethers in Nairobi river drainage basin, Kenya and study on their photocatalytic degradation	Kenya
9.	Assessing the occurrence of selected antibiotics and their fate in the municipal and hospital wastewater treatment system	Nepal
10.	Solar-assisted Photocatalytic Reduction of Organic Pollutants in Wastewater using Metal Oxide-Graphitic Carbon Nitride (MO/gCN)	Nigeria
11.	First Inventory of the Ichthyofauna Biodiversity of the Eastern Rainforest block of the Lower Cross River, Nigeria	Nigeria
12.	Putting waste into use: Recycling of textile industry wastewater for use in agriculture	Pakistan
13.	Health Risk Assessment of Multiple Mycotoxins by Wheat Consumption in Pakistan	Pakistan
14.	Synthesis of Polyurethanes Nanocomposites for Waste Water Purification of Textile Industry	Pakistan
15.	Treatment of Vegetable Oil Refinery Wastewater by Combination of Biological Process to Membrane technology for Safe and Sustainable Reuse	Tunisia
16.	Spatial distribution of Persistent Organic Pollutants in surface sediment of the Ugandan Part of Lake Victoria; an insight into sources and intra-lake mobility	Uganda
17.	Discrimination of secondary metabolite profiles of <i>Curcuma longa</i> L. pure lines collected at different regions in Vietnam	Viet Nam
18.	A low-cost, reliable method of detecting and removing antibiotics from water in Vietnam	Viet Nam
19.	Production of recombinant laccase and application on synthesis dyes degradation	Viet Nam
20.	Water decontamination and disinfection by greenly synthesized graphene oxide/Fe ₃ O ₄ /Ag Nano systems	Viet Nam

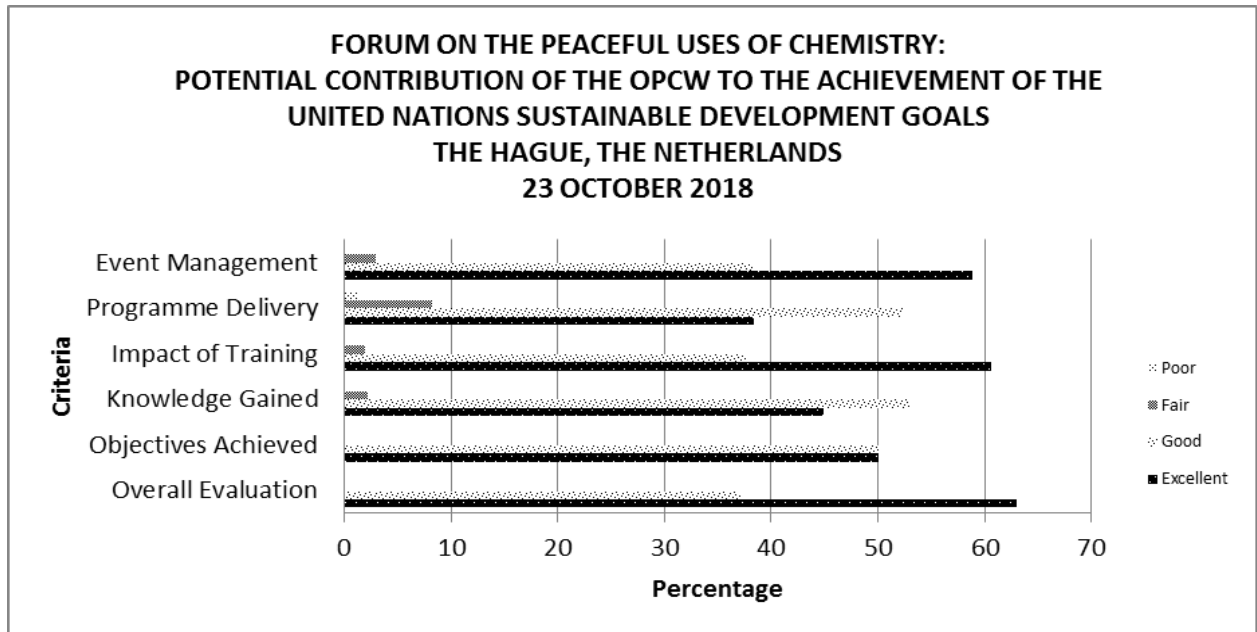
Annex 5

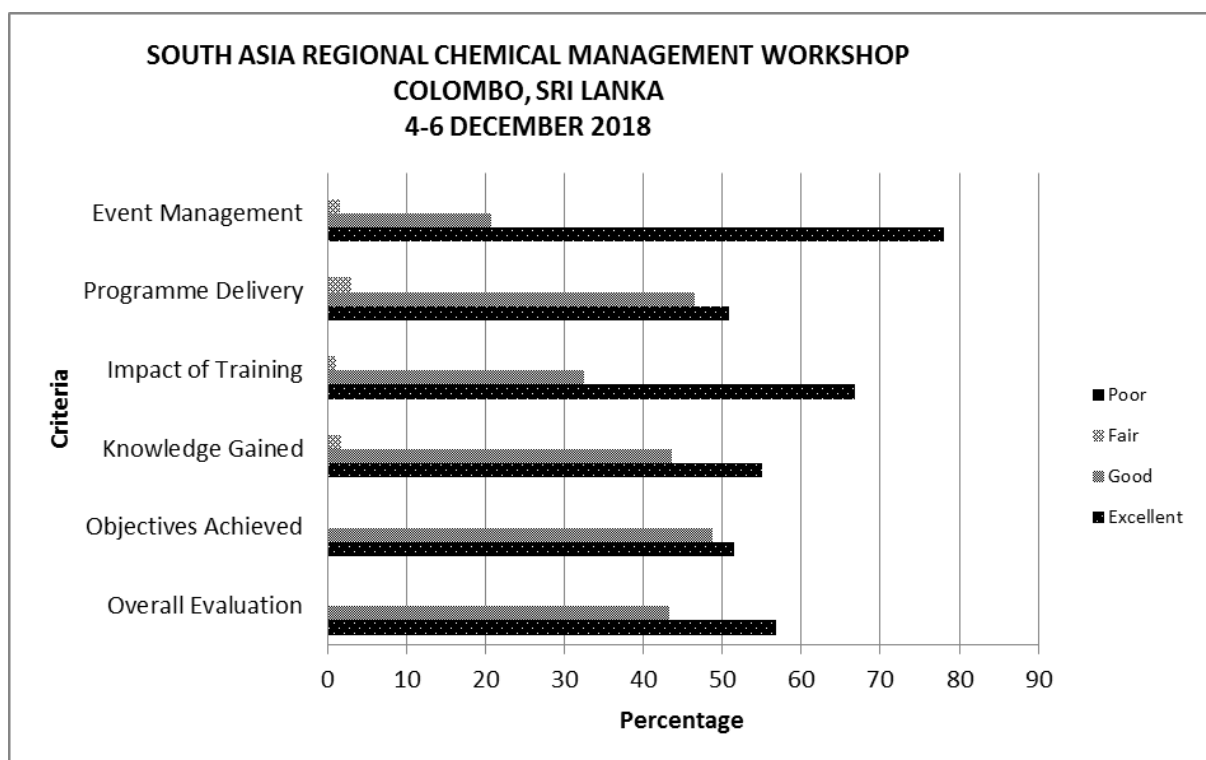
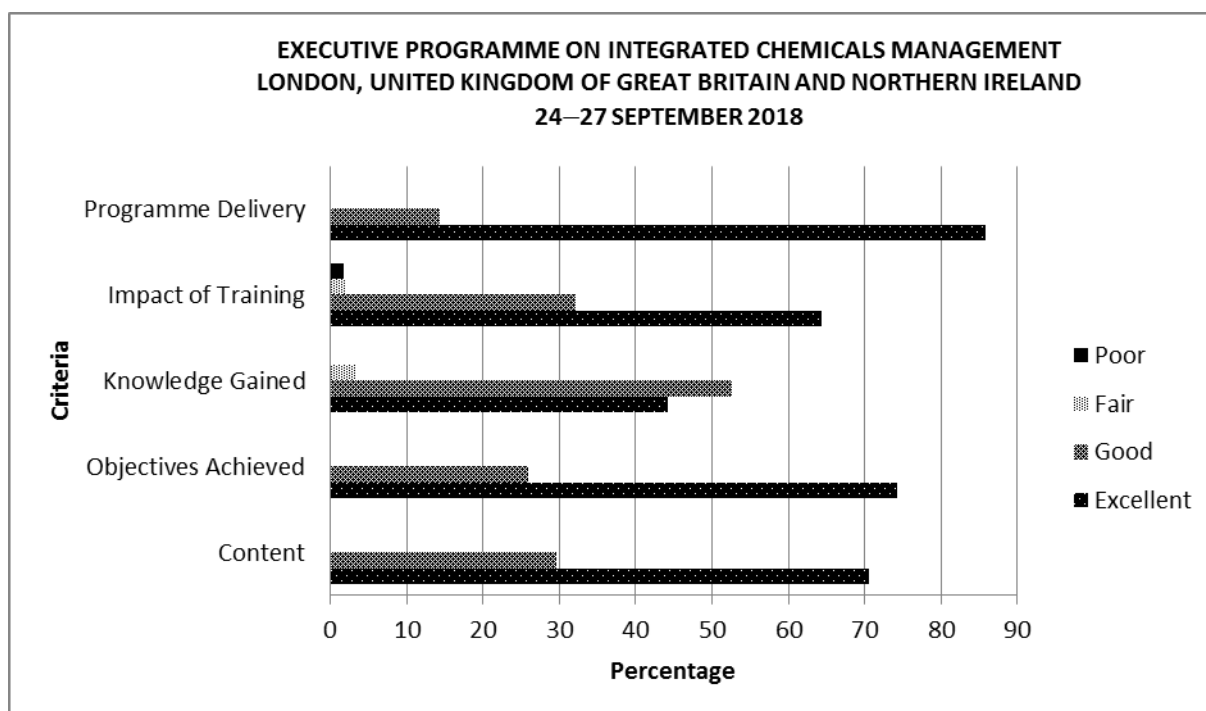
EVALUATION OF INTERNATIONAL COOPERATION PROGRAMMES

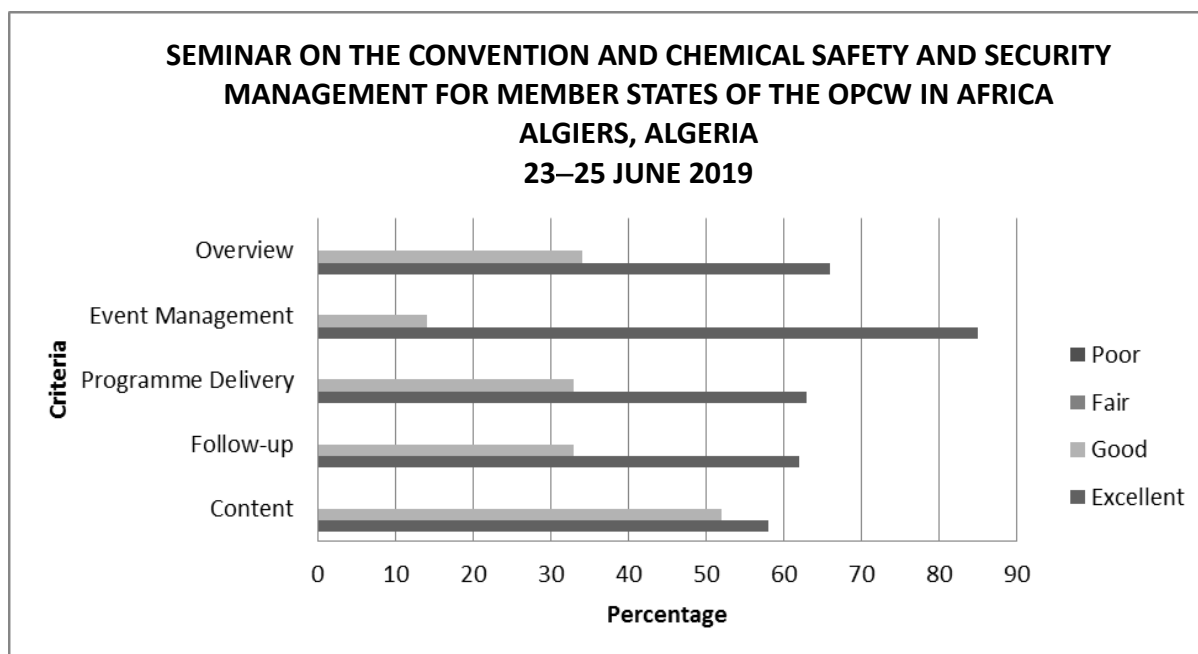
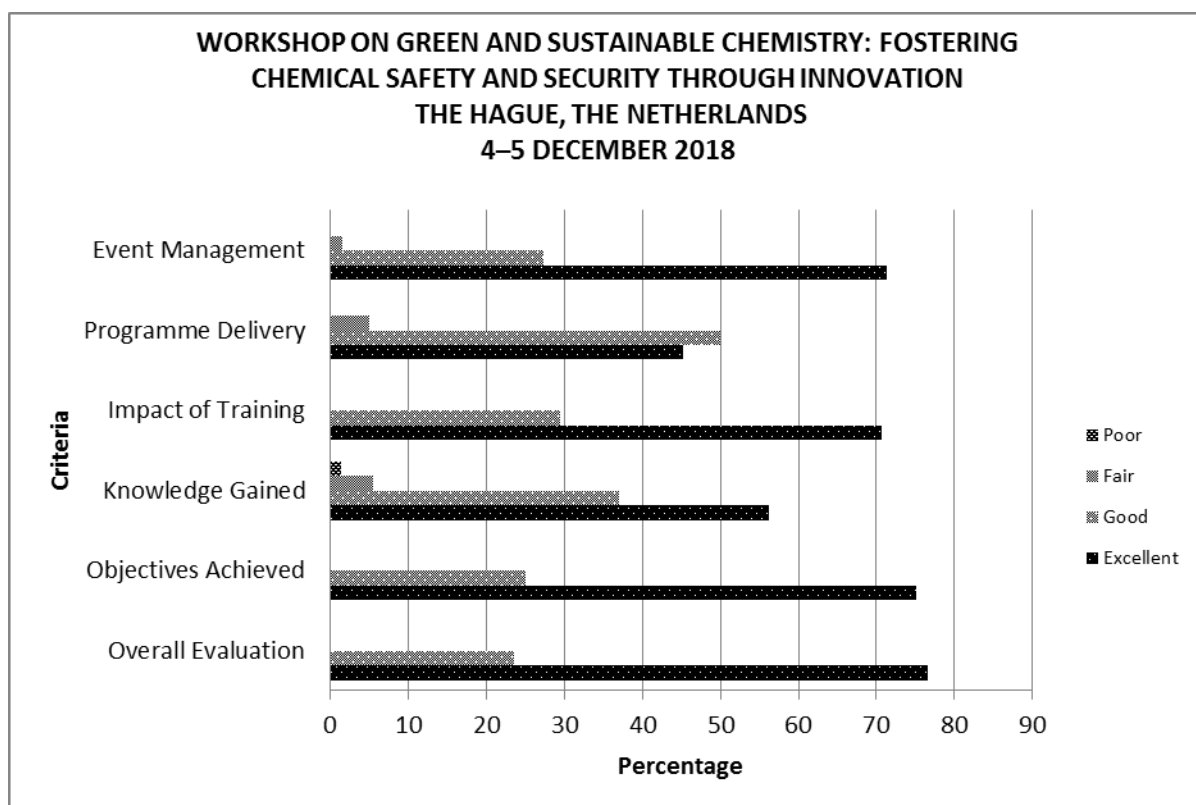
I. INTEGRATED CHEMICALS MANAGEMENT

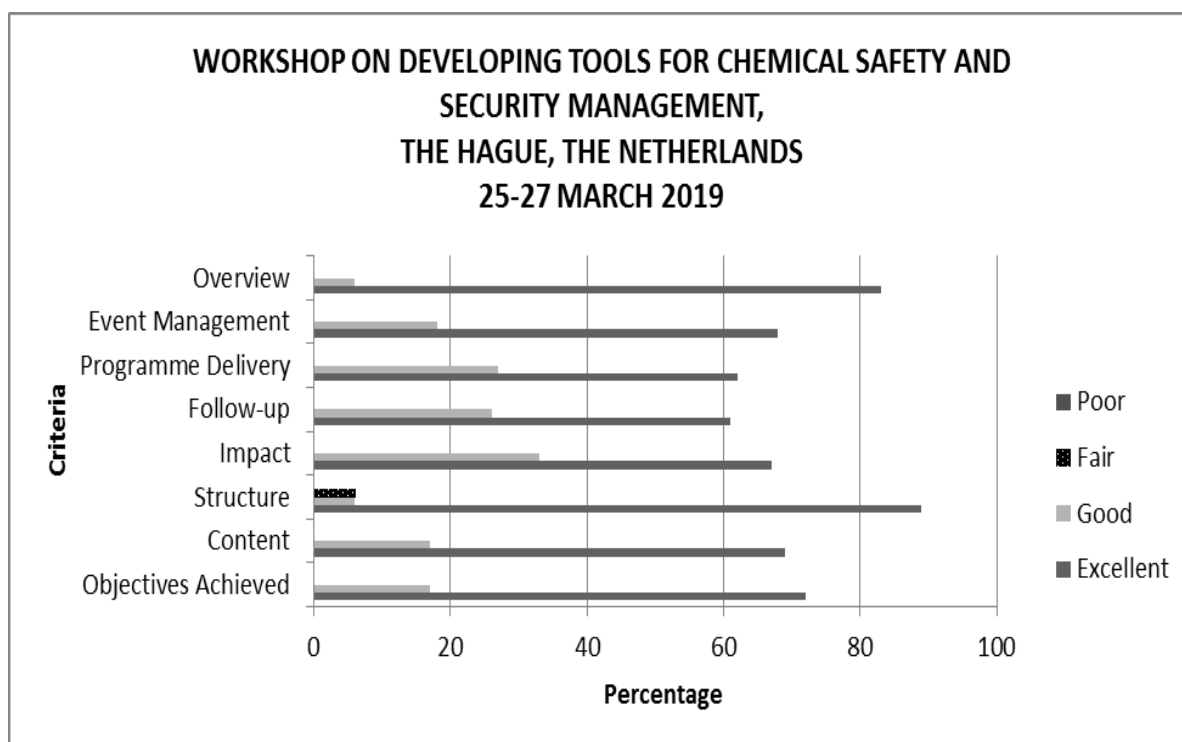
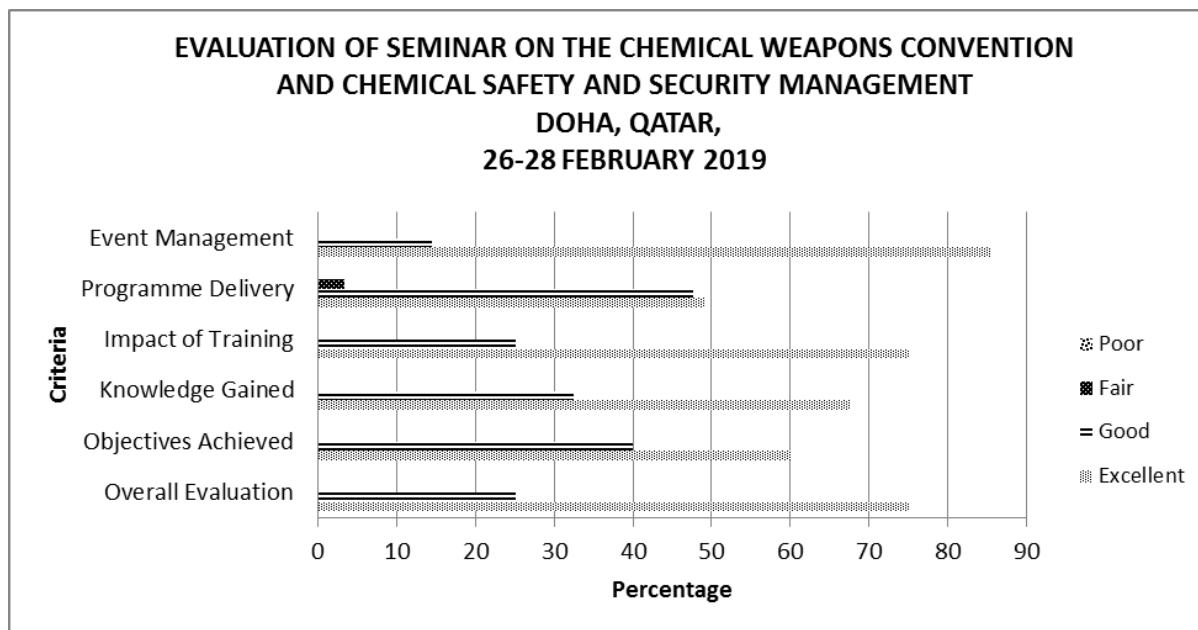




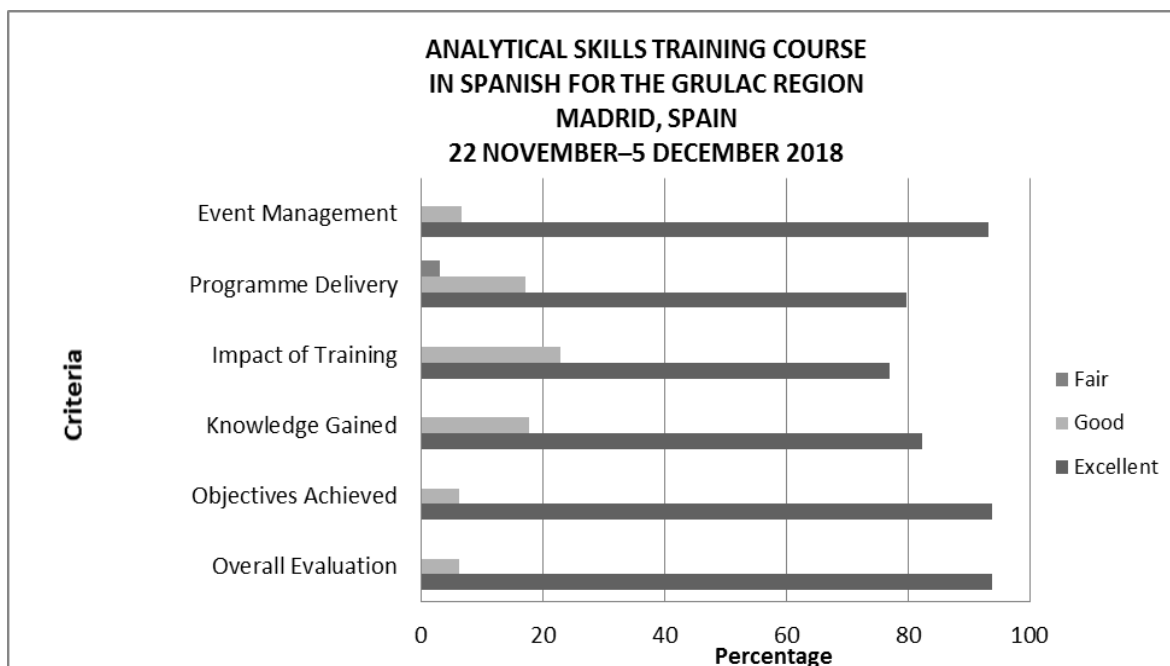
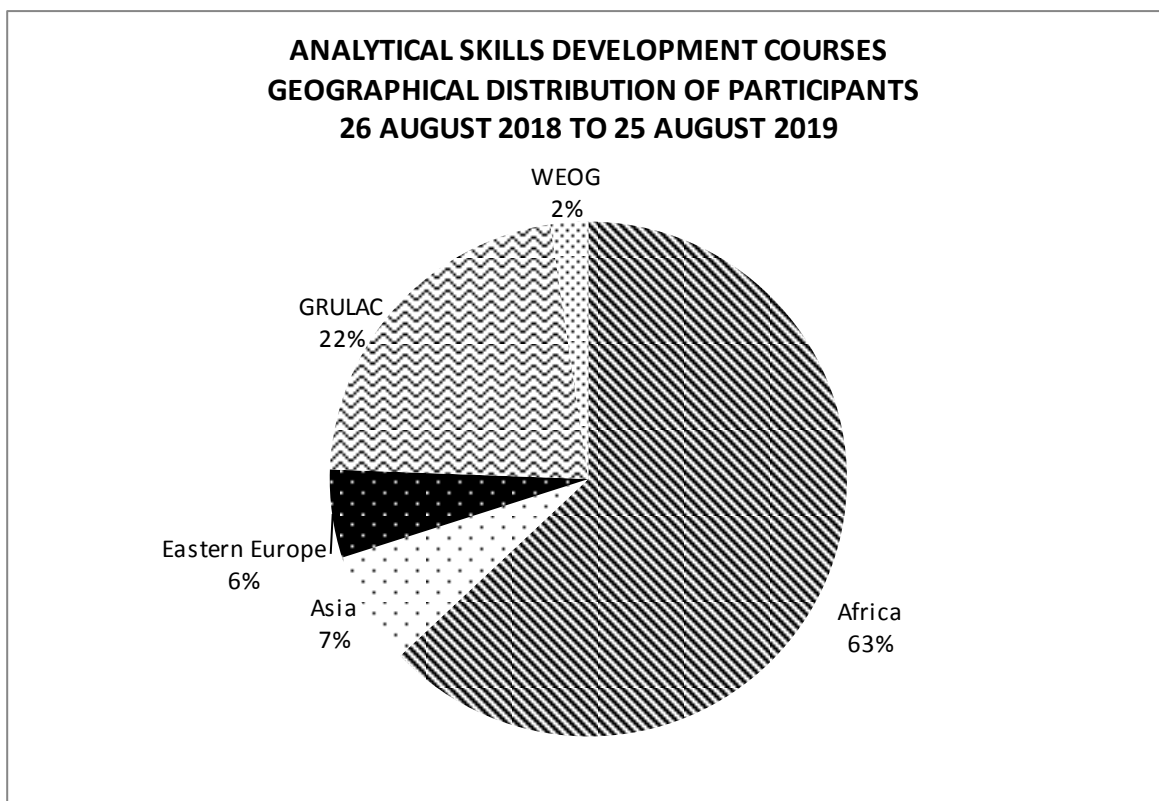


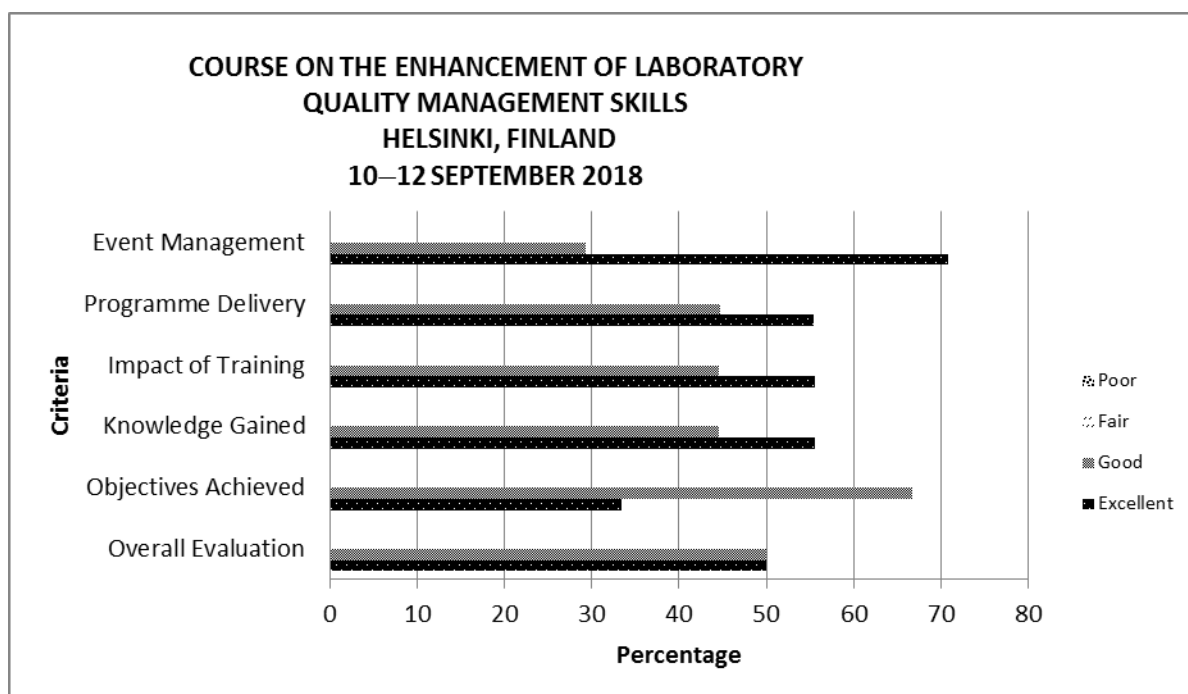
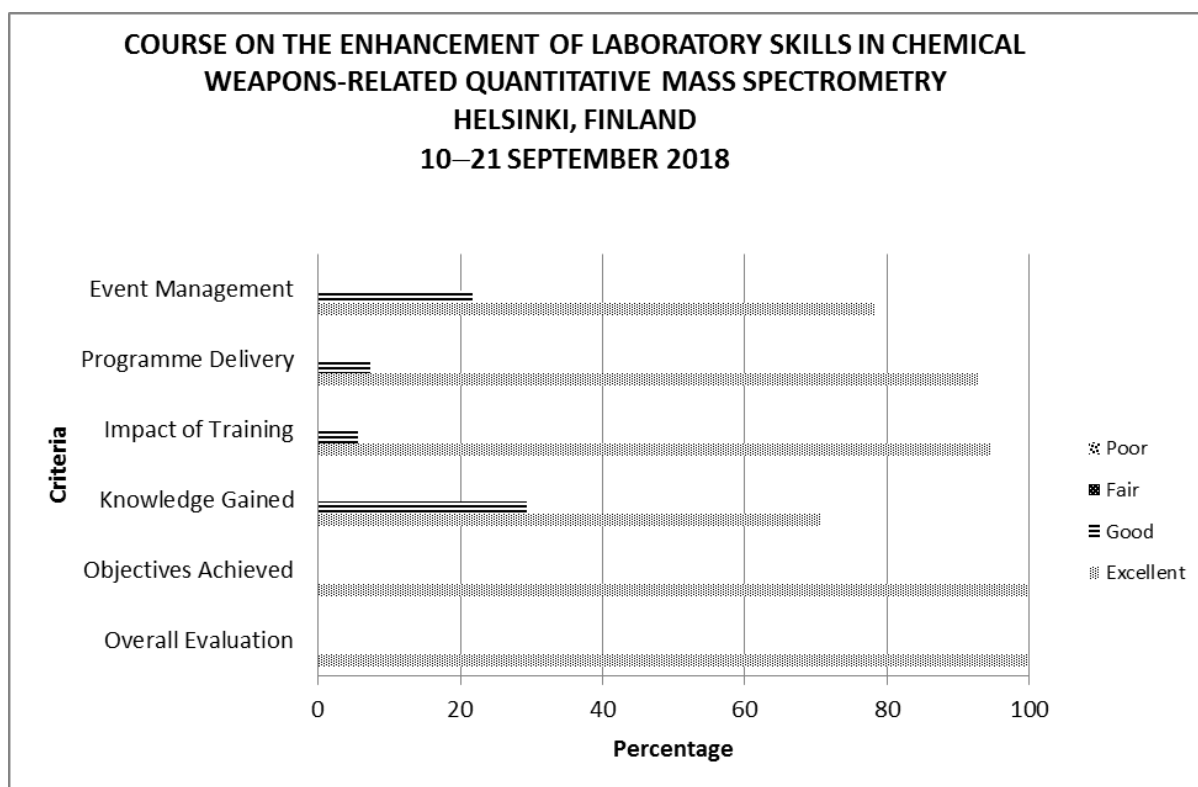


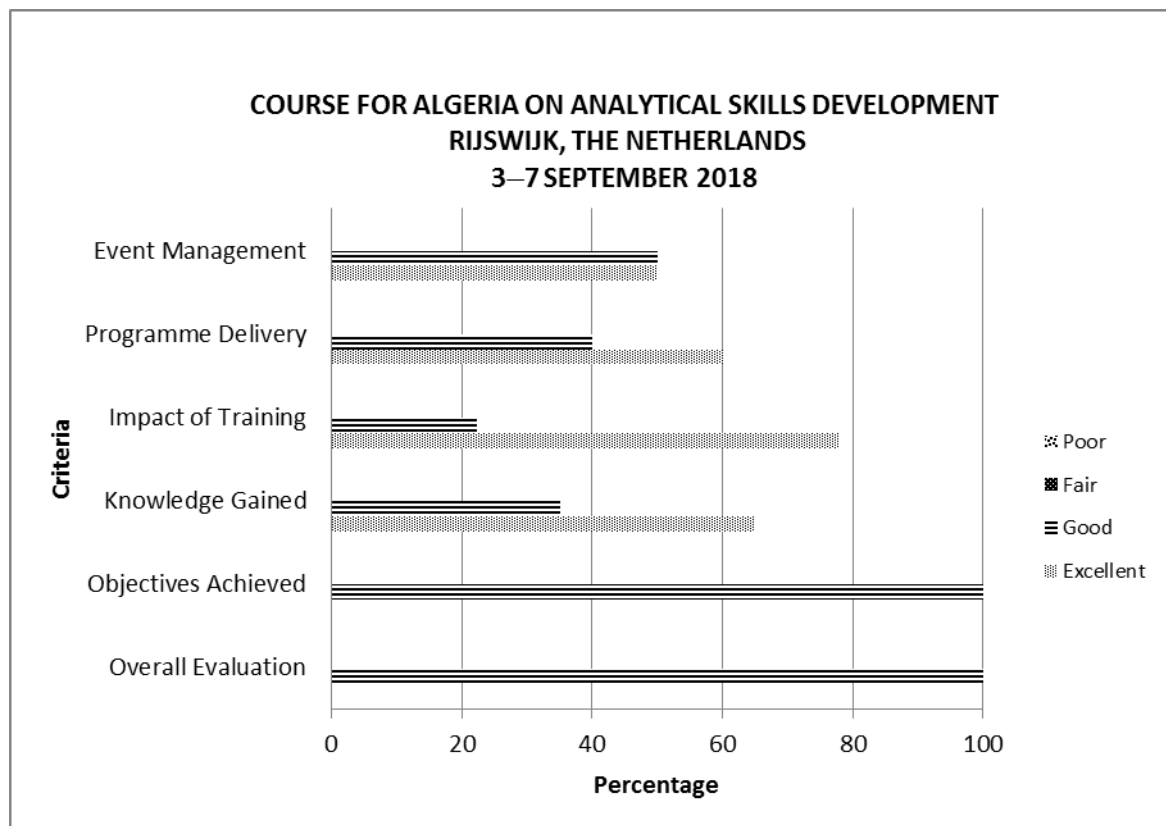
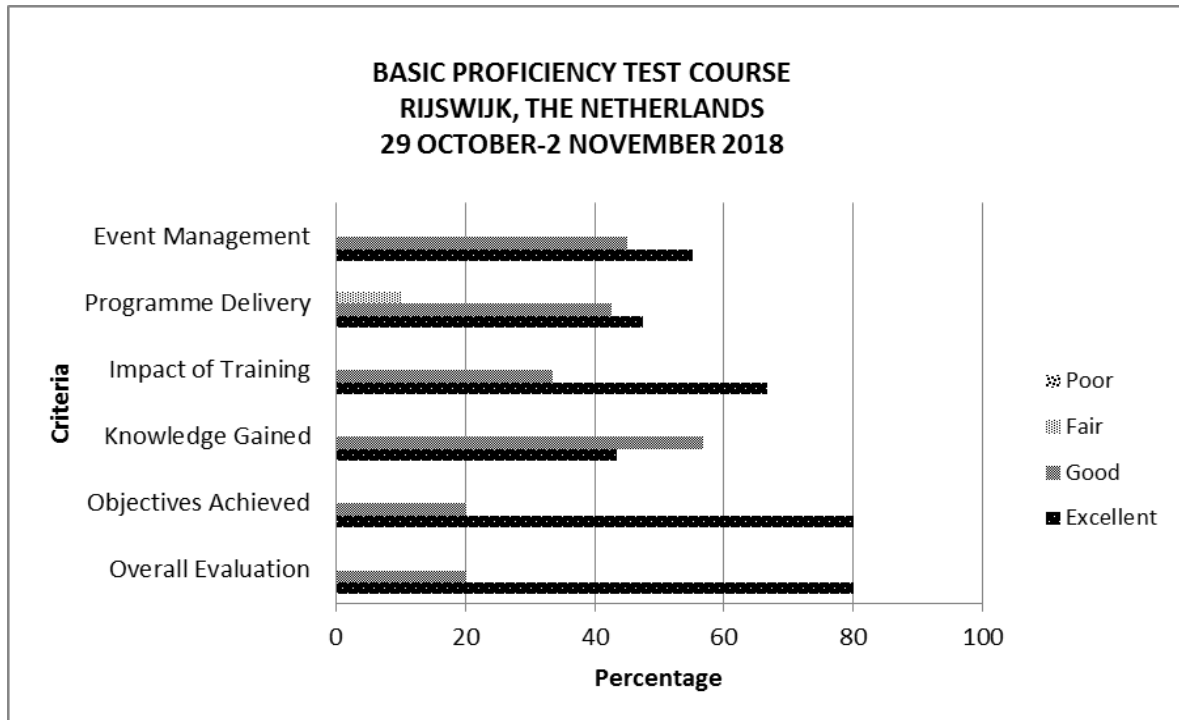


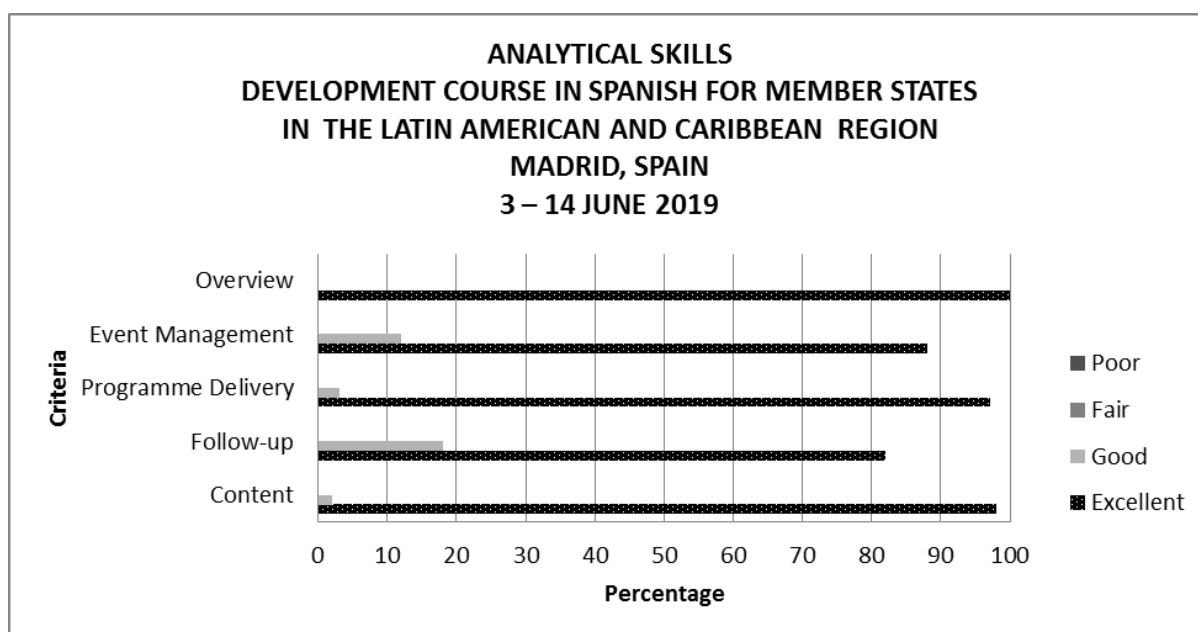
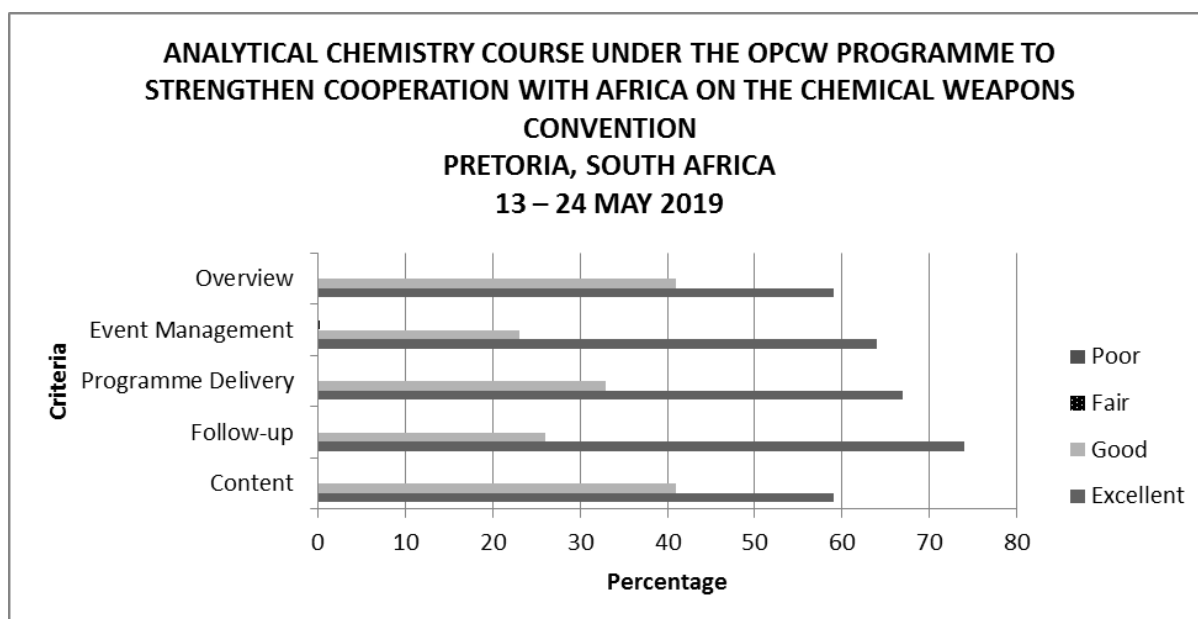


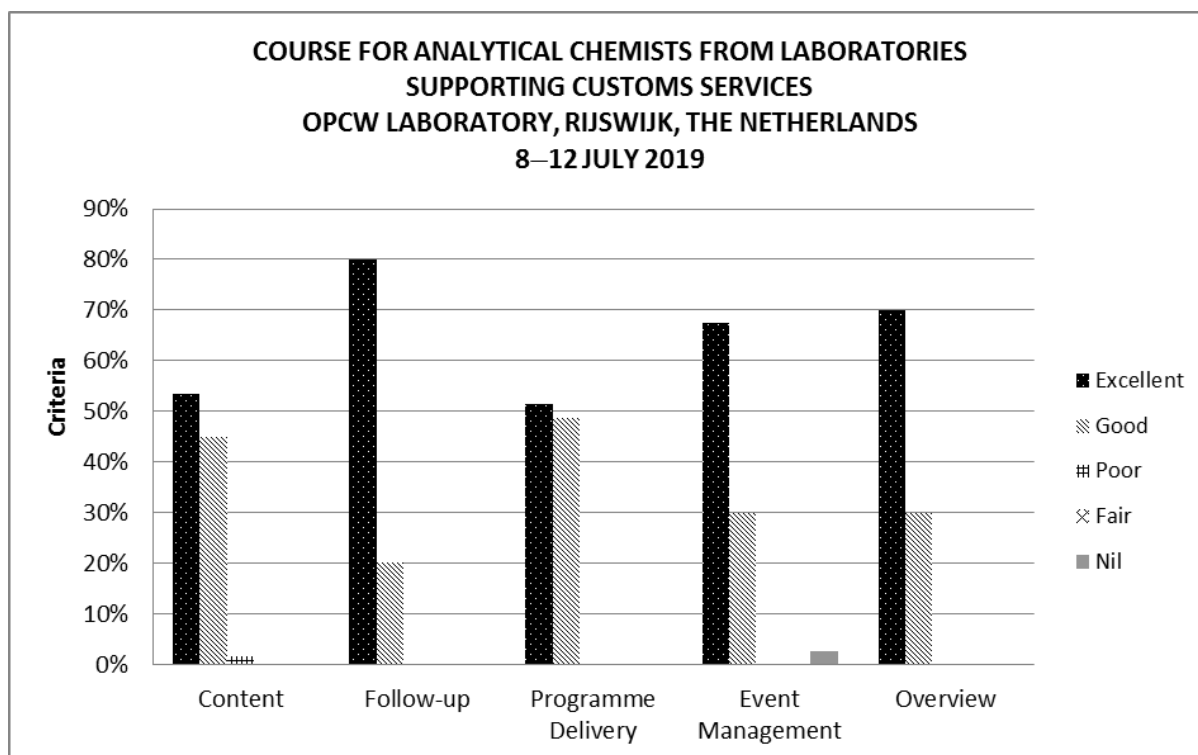
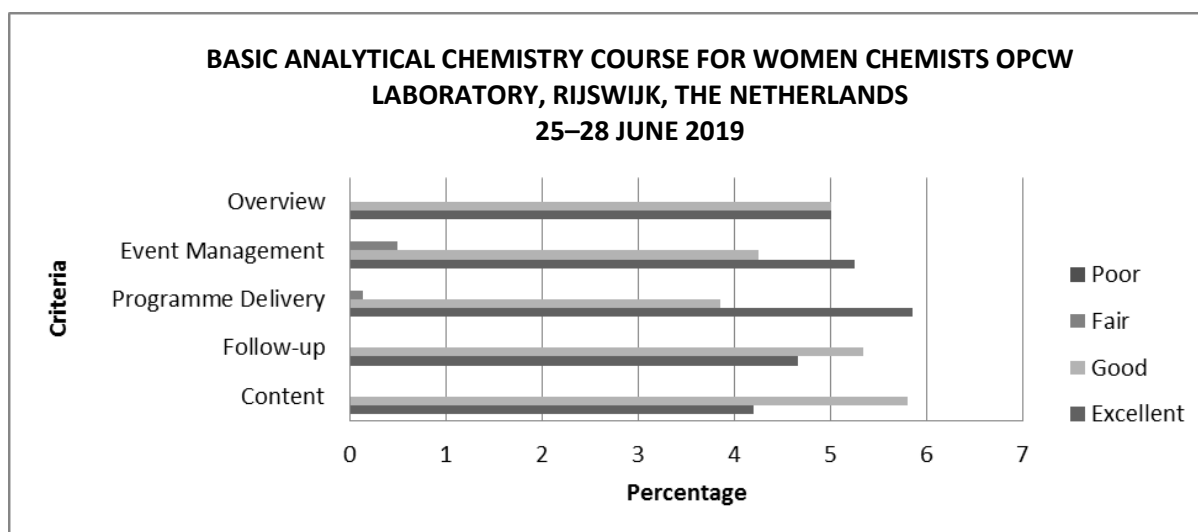
II. ENHANCEMENT OF LABORATORY CAPABILITIES



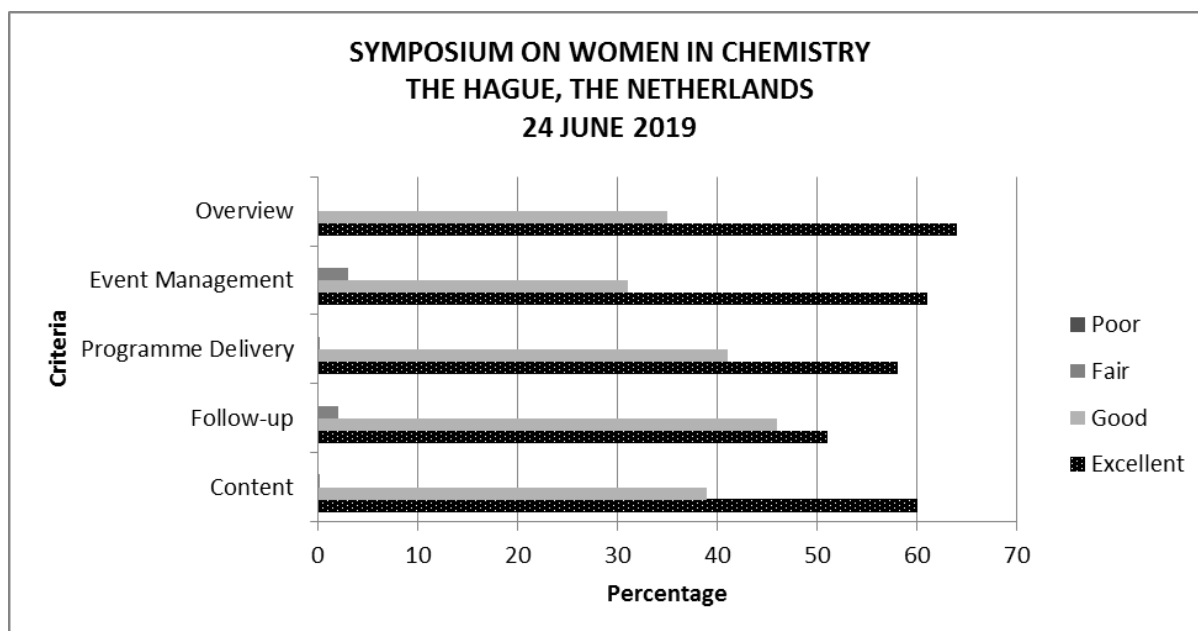
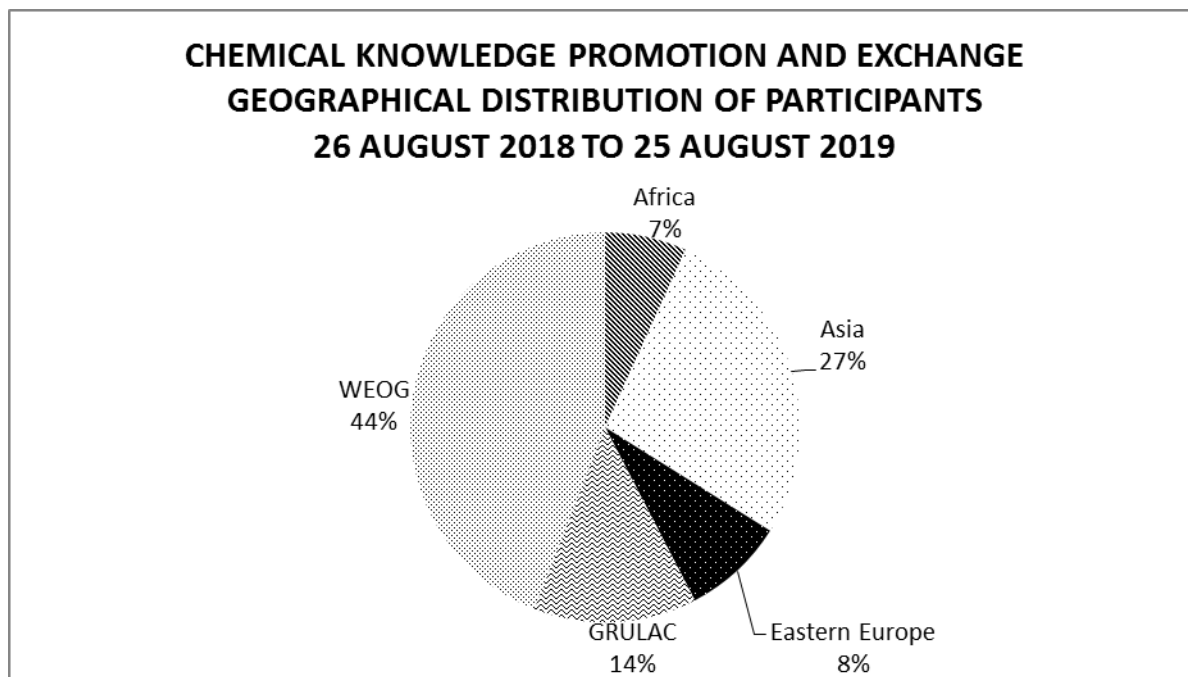






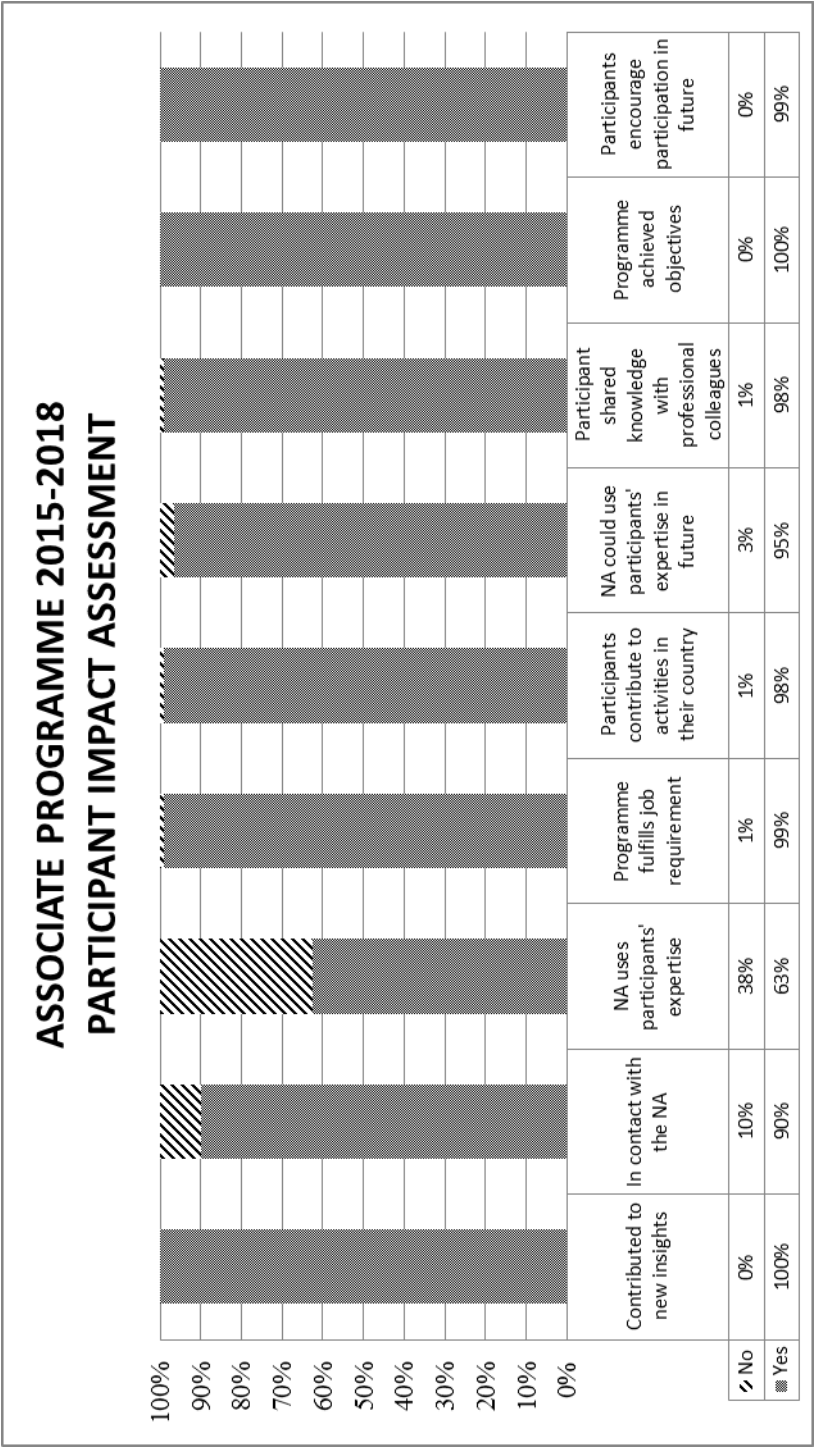


III. CHEMICAL KNOWLEDGE PROMOTION AND EXCHANGE

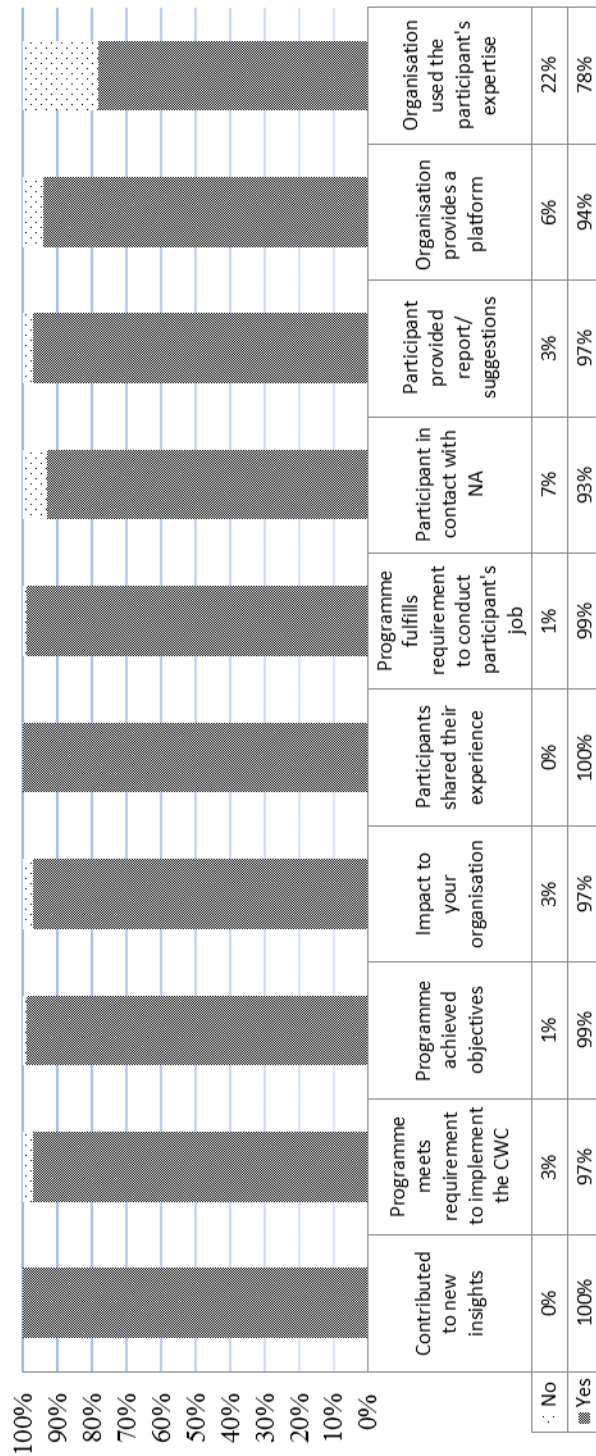


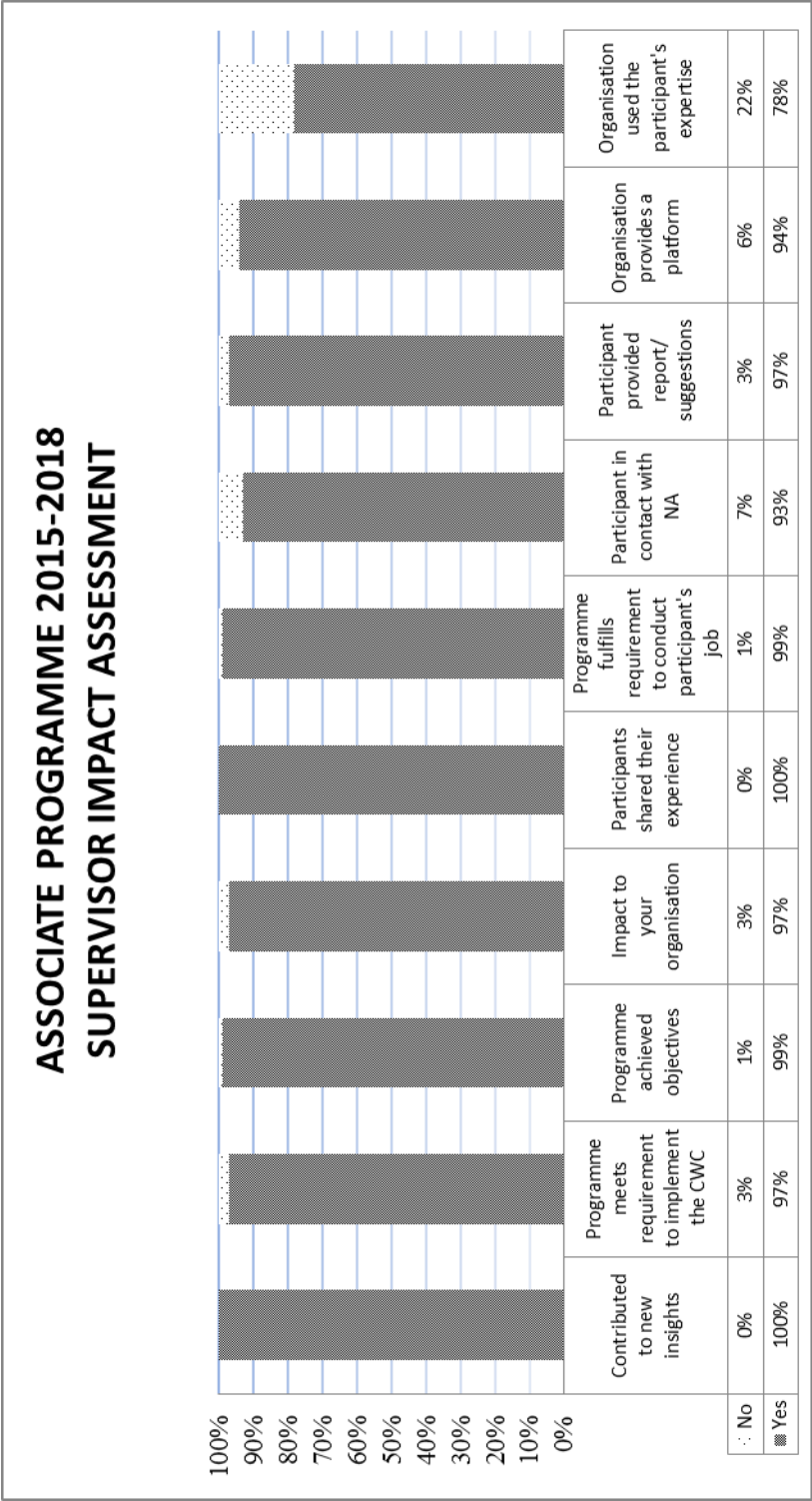
Annex 6

IMPACT ASSESSMENT OF INTERNATIONAL COOPERATION PROGRAMMES

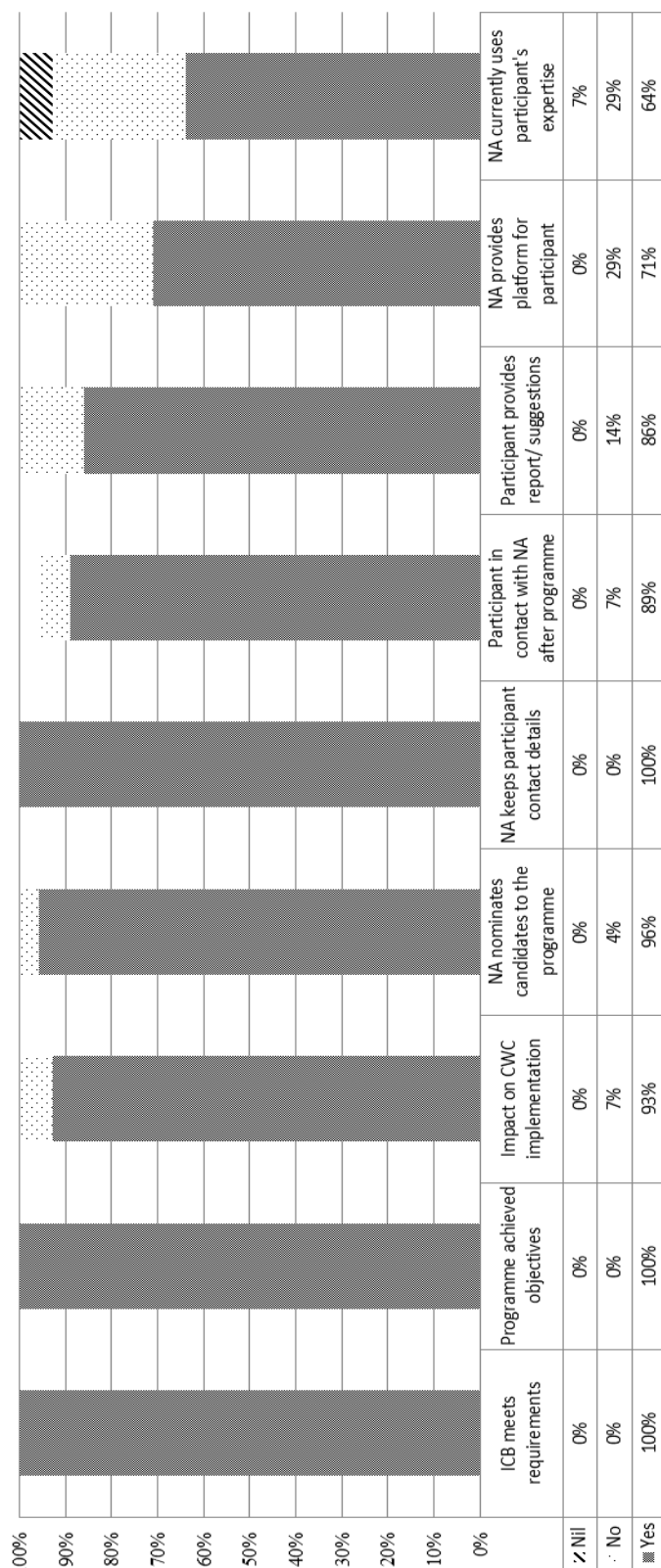


ASSOCIATE PROGRAMME 2015-2018 SUPERVISOR IMPACT ASSESSMENT





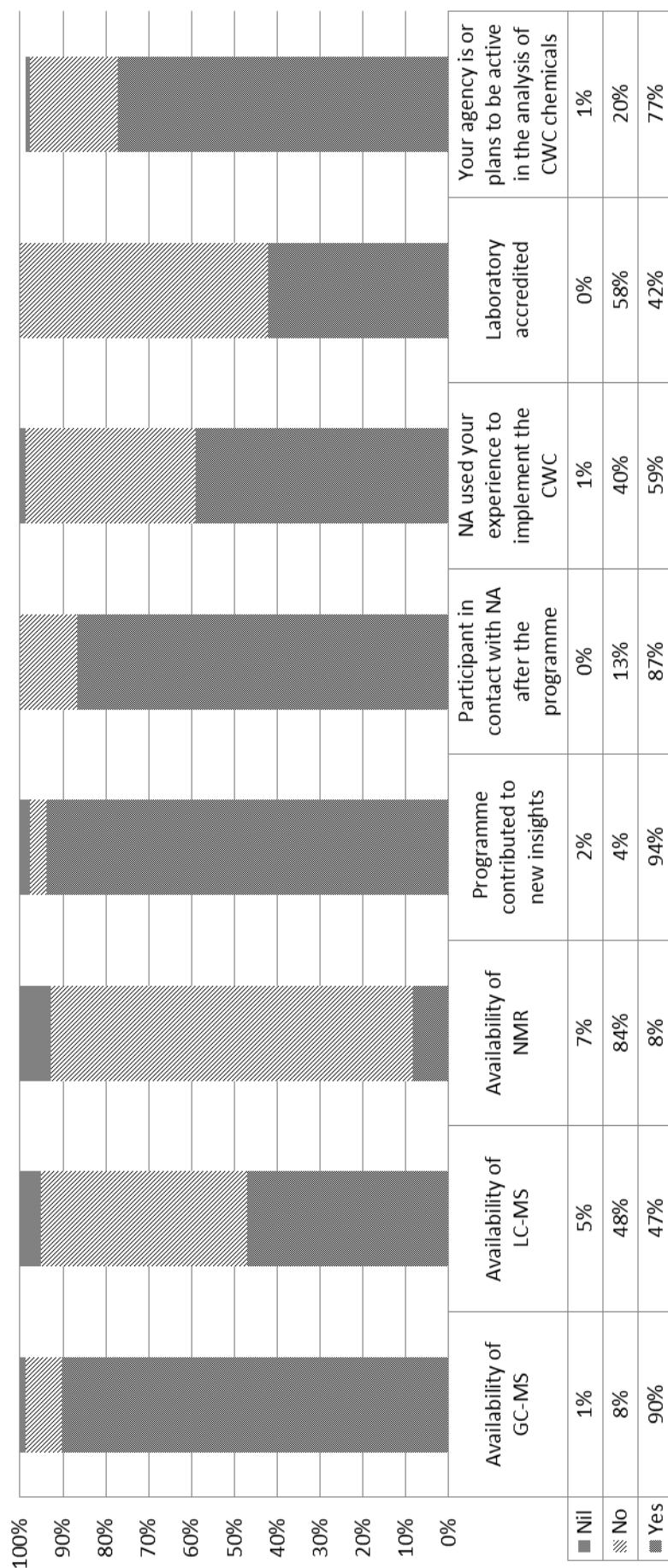
ASSOCIATE PROGRAMME 2015-2018 NATIONAL AUTHORITY IMPACT ASSESSMENT



ANALYTICAL SKILLS DEVELOPMENT COURSE 2015-2018

PARTICIPANT IMPACT ASSESSMENT

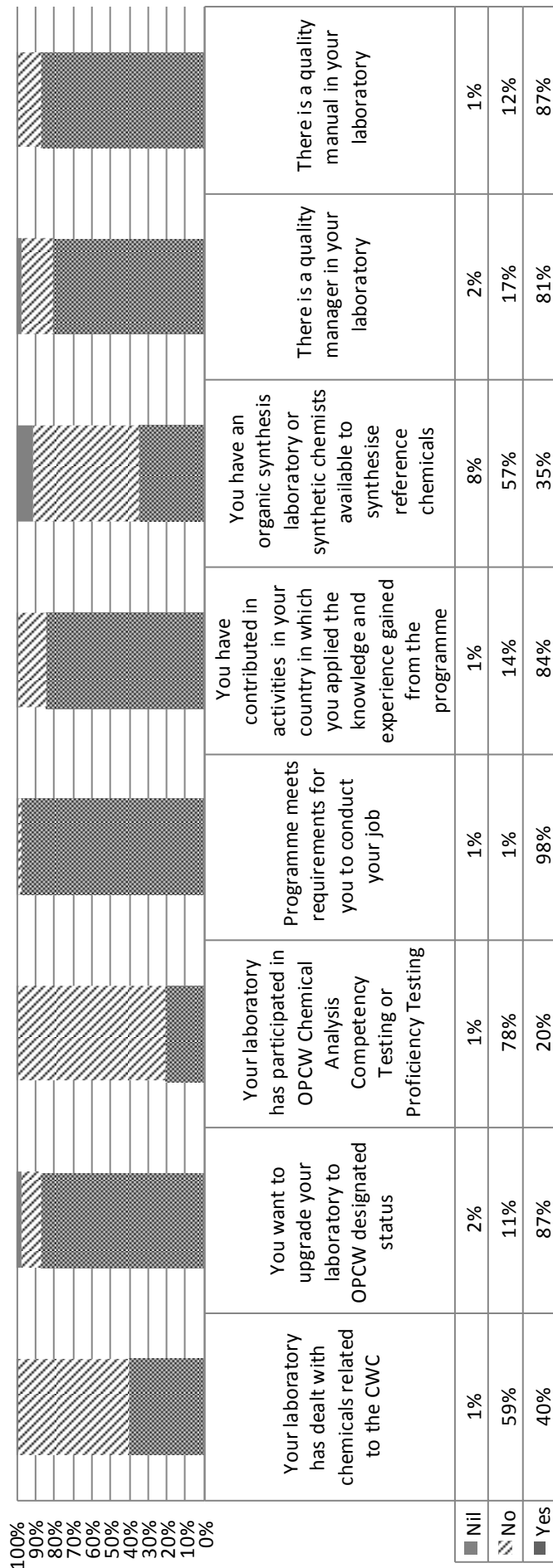
PART 1



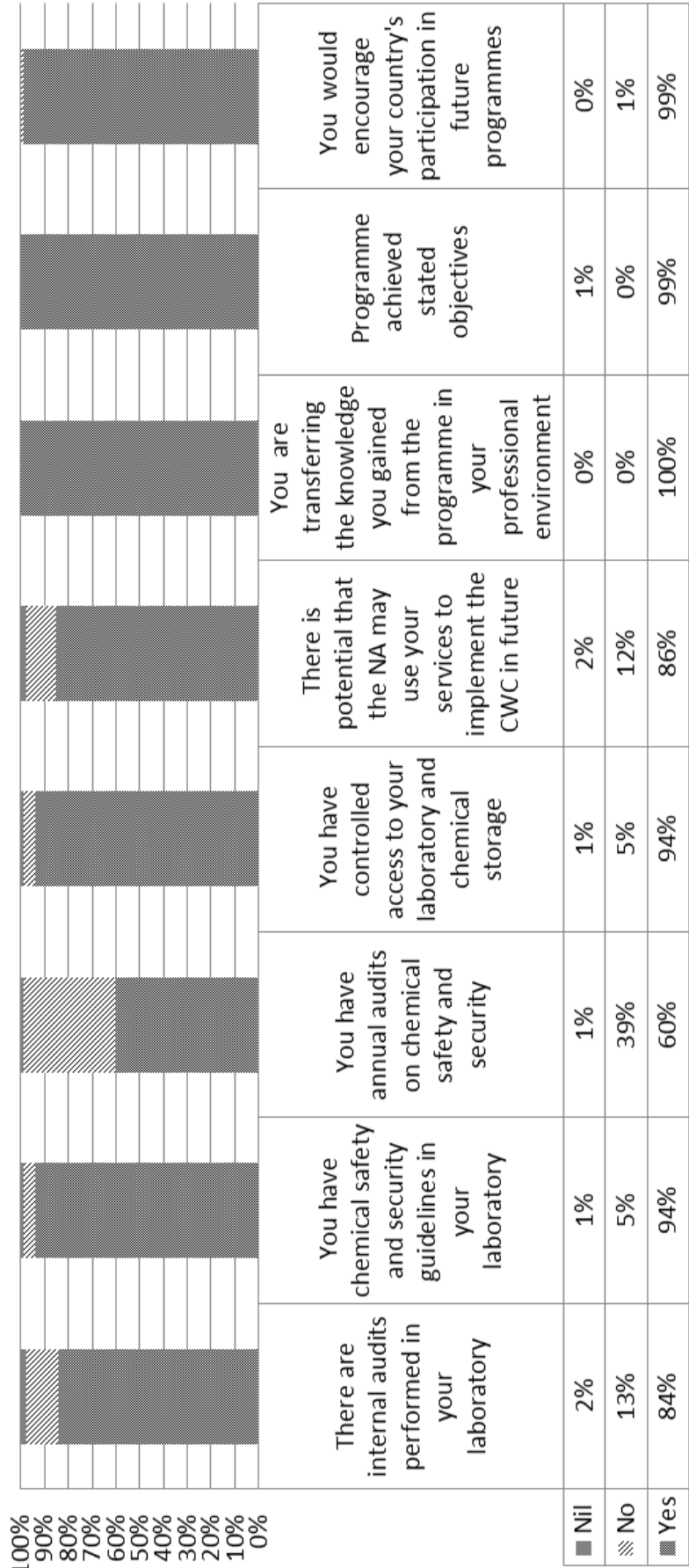
ANALYTICAL SKILLS DEVELOPMENT COURSE 2015-2018

PARTICIPANT IMPACT ASSESSMENT

PART 2



ANALYTICAL SKILLS DEVELOPMENT COURSE 2015-2018
PARTICIPANT'S IMPACT ASSESSMENT
PART 3



Annex 7

**SUMMARY OF MAIN ACTIVITIES UNDERTAKEN UNDER THE AUSPICES
OF THE INTERNATIONAL COOPERATION BRANCH
26 AUGUST 2018 TO 25 AUGUST 2019**

Programme / Initiative	Date	Venue	Benefiting States Parties	Number of Participants	Total Number of Participants	Number of States Parties
Integrated Chemicals Management						
Associate Programme	Associate Programme 2018 (28 July–3 August, 29 September–5 October 2018)	Netherlands, United Kingdom of Great Britain and Northern Ireland, and other States Parties	Afghanistan, Algeria, Argentina, Armenia, Bangladesh, Brazil, Burundi, China, Ethiopia, Gambia, Georgia, Iraq, Kenya, Malawi, Malaysia, Mauritius, Nepal, Pakistan, Panama, Paraguay, Poland, Republic of Moldova, Saudi Arabia, Senegal, Sierra Leone, Sri Lanka, Tunisia, Uzbekistan, Venezuela (Bolivarian Republic of), Zimbabwe	31	63	32
	Associate Programme 2019 (26 July–27 September 2019)		Afghanistan, Algeria, Argentina, Botswana, Brazil, Burkina Faso, Burundi, Cameroon, Chile, China, Colombia, Costa Rica, Georgia, India, Jamaica, Malawi, Malaysia, Namibia, Nepal, Nigeria, Peru, Republic of Moldova, Senegal, Serbia, South Africa, Sri Lanka, Tajikistan, Togo, Trinidad and Tobago, Uganda, Uzbekistan, Zimbabwe	32		
Integrated chemicals management events	24–28 September 2018	Wuppertal, Germany	Argentina, Bangladesh, Bhutan, Brazil, Chad, Chile, Cuba, Ethiopia, Ghana, India, Jamaica, Kenya, Malaysia, Morocco, Niger, Nigeria, Paraguay, Philippines, Senegal, Sri Lanka, Sudan, Togo, Tunisia, Uganda	24	361	76
	15–19 October 2018	Moscow, Russian Federation	Armenia (2), Azerbaijan, Belarus, Bulgaria, Kazakhstan, Kyrgyzstan, Mongolia, Republic of Moldova, Tajikistan, Uzbekistan (2)	12		

Programme / Initiative	Date	Venue	Benefiting States Parties	Number of Participants	Total Number of Participants	Number of States Parties
	9–11 October 2018	Addis Ababa, Ethiopia	Algeria, Bangladesh, Democratic Republic of the Congo, Italy, Mauritius, Malaysia, Myanmar, Nigeria, Philippines, Qatar, Seychelles, South Africa, Sudan, Viet Nam	37		
	24–27 September 2018	London, United Kingdom of Great Britain and Northern Ireland	Belgium, Bosnia and Herzegovina, Botswana, Chile, China, Grenada, Malaysia, Mozambique, Myanmar, Peru, Qatar, Saudi Arabia, Slovakia, Tajikistan, Uganda	16		
	30 October – 1 November 2018	Seoul, Republic of Korea	Bangladesh, China, India, Indonesia, Iran (Islamic Republic of), Iraq, Italy, Republic of Korea, Malaysia, Myanmar, Pakistan, Philippines, Sri Lanka, Uzbekistan, Viet Nam, Cambodia	27		
	23 October 2018	The Hague, Netherlands	Algeria, Argentina, Azerbaijan, Belize, Belgium, Bhutan, Burkina Faso, China, Colombia, Ecuador, Germany, Indonesia, Italy, Kenya, Malaysia, Morocco, Myanmar, Panama, Pakistan, Philippines, Poland, Sao Tome and Principe, Saudi Arabia, South Africa, Sri Lanka, Sudan, Switzerland, United States of America	32		
	4–5 December 2018	The Hague, Netherlands	Algeria, Bangladesh, Belgium, Brazil (2), Ecuador, France, Germany, India, Indonesia, Iraq, Italy (2), Malaysia, Paraguay, Philippines, Russian Federation, South Africa, Sudan, Thailand	20		
	4–6 December 2018	Colombo, Sri Lanka	Afghanistan, Bangladesh, Italy, India, Indonesia, Malaysia, Pakistan, Philippines, Sri Lanka, United States of America	48		
	26–28 February 2019	Doha, Qatar	Bangladesh, Belgium, China, Germany, India, Indonesia, Iran (Islamic Republic of), Jordan, Malaysia, Pakistan,	66		

Programme / Initiative	Date	Venue	Benefiting States Parties	Number of Participants	Total Number of Participants	Number of States Parties
			Philippines, Qatar, Republic of Korea, Sri Lanka, Tajikistan, Viet Nam			
	25–27 March 2019	The Hague, Netherlands	Algeria, Bangladesh, Belgium, Brazil, China, Costa Rica, Germany, Indonesia, Italy, Republic of Korea, Niger, Pakistan, Philippines, Sri Lanka, United Kingdom of Great Britain and Northern Ireland, United States of America	21		
	23–25 June 2019	Algiers, Algeria	Algeria, Burkina Faso, Gambia, Malawi, Morocco, Namibia, Nigeria, Mauritius, Sudan, Uganda	27		
	15–18 July 2019	San Jose, Costa Rica	Argentina, Barbados, Belize, Bolivia, Chile, Costa Rica, Cuba, El Salvador, Guatemala, Honduras, Nicaragua, Panama, Paraguay, Peru, Saint Vincent and the Grenadines, Suriname	31		
Enhancement of Laboratory Capabilities						
Analytical skills development courses and proficiency test training	3–7 September 2018	Rijswijk, Netherlands	Algeria	3	131	48
	10–21 September 2018	Helsinki, Finland	Argentina, Costa Rica, Cuba, Ghana, Kazakhstan, Morocco, Nigeria, Sri Lanka, Tunisia, Ukraine, Uganda, Zimbabwe	12		
	16–26 October 2018	Sidi Thabet, Tunisia	Algeria, Burkina Faso, Burundi, Cameroon, Côte d'Ivoire, Democratic Republic of the Congo, Madagascar, Mali, Mauritius, Morocco, Tunisia, Senegal, Togo	15		
	22 November – 5 December 2018	Madrid, Spain	Argentina (2), Brazil (2), Costa Rica, Cuba, Ecuador, Guatemala (2), Mexico, Panama, Paraguay, Peru, Uruguay	15		
	29 October–2 November 2018	Rijswijk, Netherlands	Algeria, Botswana, Kenya, Nigeria, Uganda	5		
	3–14 December 2018	IICT, Hyderabad, India	Algeria, Bangladesh, Brazil, Chile, Costa Rica, Ethiopia, Mexico, Morocco, Nigeria, Philippines, Republic of Moldova, Serbia, Sri Lanka, Sudan, Tunisia, Uganda, Viet Nam, Zimbabwe	19		

Programme / Initiative	Date	Venue	Benefiting States Parties	Number of Participants	Total Number of Participants	Number of States Parties
	8–12 April 2019	Rijswijk, Netherlands	Qatar	5		
	13–24 May 2019	Pretoria, South Africa	Algeria (2), Burkina Faso, Cameroon, Kenya (2), Lesotho, Malawi, Morocco (2), Nigeria (2), Sudan, Uganda (2), United Republic of Tanzania (2), Zambia, Zimbabwe (2), South Africa (2)	22		
	3–14 June 2019	Madrid, Spain	Argentina (2), Brazil (2), Chile, Colombia, Costa Rica, Cuba, Guatemala, Panama, Paraguay, Peru (2), Uruguay, Venezuela (Bolivarian Republic of)	15		
	25–28 June 2019	Rijswijk, Netherlands	Cuba, Ecuador, Grenada, Iraq, Malawi, Morocco, Nigeria, Oman, Slovakia, Ukraine	10		
	8–12 July 2019	Rijswijk, Netherlands	Argentina, Bulgaria, China, Costa Rica, Germany, Ireland, Luxembourg, Madagascar, United Republic of Tanzania, Zimbabwe	10		
Equipment Exchange Programme	2018–2019	Ethiopia	Ethiopia	1	0	0
Chemical Knowledge Promotion and Exchange						
Conference Support Programme	2–6 September 2018	Cavtat, Croatia	Georgia, India, Iran (Islamic Republic of), Iraq, Russian Federation, Turkey	6	44	26
	24–25 October 2018	Kerala, India	Bangladesh and South Africa	2		
	16–19 June 2019	Delft, Netherlands	China	3		
	1–8 June 2019	Erice, Italy	Argentina and India (2)	3		
	1–8 June 2019	Erice, Italy	Argentina, Brazil, India, Poland	4		
	2–6 June 2019	Lecce, Italy	China, Pakistan, India,	5		

Programme / Initiative	Date	Venue	Benefiting States Parties	Number of Participants	Total Number of Participants	Number of States Parties
			Singapore, South Africa			
	12–19 May 2019	Dar es Salaam, United Republic of Tanzania	Ghana, Nigeria, South Africa, Uganda	4		
	10–14 June 2019	Gaborone, Botswana	Kenya (2), Lesotho, Malawi, South Africa (2), Sudan, Uganda, United Republic of Tanzania, Zambia, Zimbabwe	11		
	25–30 August 2019	Kyoto, Japan	Brazil, Ghana, India, Indonesia, Myanmar, South Africa	6		
Programme for Support of Research Projects	August 2017–August 2018	Same as benefiting States Parties	Argentina, Bangladesh, Benin, Brazil, Cuba, Ethiopia, Ghana, Indonesia, Iran (Islamic Republic of), Kenya, Malaysia, Pakistan, Serbia, South Africa, Togo, Tunisia, Turkey, Uganda, Uruguay, Viet Nam	41	41	20
Fellowship Programme	26 August 2018–25 August 2019	Finland, France, Germany, South Africa, Spain, Sweden, Switzerland, Netherlands	Brazil, Cameroon, Kenya, Malaysia, Uganda	11	11	5
Chemical knowledge promotion and exchange events	24 June 2019	The Hague, Netherlands	Algeria, Azerbaijan, Bangladesh, Belarus, Benin, Cameroon, Canada, Colombia, Cuba, Ecuador, Germany, Grenada, Guatemala, India, Iraq, Italy, Jordan, Kenya, Lao People's Democratic Republic, Malawi, Malaysia, Morocco, New Zealand, Nigeria, Oman, Pakistan, Peru, Saudi Arabia, Slovakia, Tanzania, Uganda, Ukraine, United States of America, Viet Nam, Zimbabwe	19	84	40

Programme / Initiative	Date	Venue	Benefiting States Parties	Number of Participants	Total Number of Participants	Number of States Parties
Article XI	1 July 2019	The Hague, Netherlands	Algeria, Argentina, Australia, Bangladesh, Belgium, Brazil, Cameroon, Chile, China, Colombia, Costa Rica, Cuba, France, Germany, Guatemala, India, Indonesia, Iran (Islamic Republic of), Japan, Kenya, Morocco, Netherlands, Nicaragua, Nigeria, Panama, Peru, Poland, Republic of Korea, Serbia, South Africa, State of Palestine, Uganda, United Kingdom of Great Britain and Northern Ireland, United States of America, Uruguay, Venezuela (Bolivarian Republic of)	60	60	37