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**REPORT BY THE DIRECTOR-GENERAL**

**THE STATUS OF IMPLEMENTATION OF ARTICLE XI  
OF THE CHEMICAL WEAPONS CONVENTION  
AS AT 31 DECEMBER 2009**

**1. INTRODUCTION**

This report on the status of implementation of Article XI of the Chemical Weapons Convention (hereinafter “the Convention”) covers the period from 1 January to 31 December 2009. Unless otherwise stated, all dates given herein fall within this reporting period.

**2. ACTIVITIES UNDER ARTICLE XI**

2.1 During the reporting period, the OPCW implemented Article XI of the Convention through the following programmes:

- (a) Associate Programme
- (b) Conference-Support Programme
- (c) Internship-Support Programme
- (d) Programme for Support of Research Projects
- (e) Laboratory-Assistance Programme
- (f) Analytical-Skills-Development Courses
- (g) Industry Outreach
- (h) Equipment-Exchange Programme
- (i) Information Service
- (j) OPCW Programme to Strengthen Cooperation with Africa (the “Africa Programme”)



- 2.2 In accordance with the results-based approach that the Technical Secretariat (hereinafter “the Secretariat”) took during the reporting period, the effectiveness of these programmes was assessed according to whether skills and capabilities were enhanced in the four focal areas relating to the peaceful application of chemistry: integrated chemicals management, chemical knowledge and the exchange of information, enhancement of laboratory capabilities, and outreach to industry.

### **Associate Programme**

- 2.3 The Associate Programme facilitates capacity building and industry-related national implementation of the Convention. It also aims to promote trade by encouraging the adoption of good practices in chemical manufacturing and safety, as well as to increase the pool of human resources upon which the National Authorities and the OPCW can draw in the future. The Associate Programme provides a unique opportunity for scientists and chemical engineers from countries whose economies are developing or in transition to observe modern chemical-industry practices and to learn more about the Convention.
- 2.4 The 2009 edition of the Associate Programme was held from 17 July to 25 September 2009. The programme was expanded to accommodate more participants under the Africa Programme. Twenty-eight participants who successfully completed the Programme came from the following Member States: Algeria, Bangladesh, Burkina Faso, Burundi, Cameroon, Colombia, Cuba, Ethiopia, Ghana, India, Jordan, Kenya (2), the Lao People’s Democratic Republic, Madagascar, Malawi, Malaysia, Nigeria, Pakistan, Peru, the Philippines, Qatar, Senegal, the Sudan, Suriname, Uganda, Viet Nam, and Zimbabwe.
- 2.5 The Programme received financial and in-kind contributions from Japan and the United Kingdom of Great Britain and Northern Ireland, and industry support from 15 companies located in: Belgium (Evonik Degussa GmbH, Tessenderlo Chemie NV, Polyol Belgium Bvba); Denmark (Danisco A/S); Germany (BASF); India (Ranbaxy Laboratories Ltd. and Heubach Colour Pvt. Ltd.); Italy (Polimeri Europa S.p.A. and Zschimmer & Schwarz Italiana S.p.A); Japan (Mitsubishi Chemicals Co. Ltd and Sumitomo Chemicals Co. Ltd); the Netherlands (DOW Benelux B.V. and DuPont de Nemours B.V.); Poland (Zakłady Azotowe w Tarnowie-Mościcach S.A.); and Spain (FMC Foret S.A.).
- 2.6 As part of the Programme, participants undertook a three-week university module organised by the University of Surrey in the United Kingdom of Great Britain and Northern Ireland. The participants benefited from an intensive laboratory-based training programme to gain additional knowledge in chemistry and chemical processes, as well as in skills related to the national implementation of the Convention.
- 2.7 The Programme also benefited from the support of the European Chemical Industry Council (CEFIC) under their “Responsible Care” policy, the Committee on Chemistry Education of the International Union of Pure and Applied Chemistry (IUPAC), the European Chemicals Agency (ECHA), the World Customs Organization (WCO), the Netherlands Customs Authority, the library of the Delft University of Technology in the Netherlands, and Deltalinqs in the Netherlands.

- 2.8 The Associate Programme has five distinct components, each of which is evaluated by the participants and the tutors, and by mentors in the chemical industry, thus providing a holistic assessment of the Programme. For the current year under review, the evaluations indicated that 96% of the participants deemed the course to be either very good or excellent. The participants were particularly appreciative of the experience of being a part of the real environment in a modern chemical plant. The feedback received from the supervisors in the Secretariat, from the University of Surrey, and from industries showed that the overall performance of the participants this year was among the best over the last 10 years.
- 2.9 The overall assessment was that the 2009 Associate Programme had been successfully conducted, and that the future editions of the Programme could be carried out along the same lines; this opinion was also shared by the representatives of those Permanent Delegations that had provided substantial support for the Programme, with an agreement that more should be done to consolidate and expand the Associate Programme.

### **Conference-Support Programme**

- 2.10 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. The support is generally in the form of sponsorship to scientists, technical personnel, and resource persons from Member States to attend such events and support to enable the cost of publications to be met. Sponsorship is channelled through scientific institutions and conference organisers in Member States.
- 2.11 During the period under review, the OPCW supported the following events:
- (a) Six participants from six Member States (Germany, India, Italy, Nepal, the Republic of Korea, and the United Republic of Tanzania) attended the “Bangladesh Chemical Congress 2008” in Dhaka, Bangladesh, which took place from 30 January to 1 February 2009. The Congress provided an opportunity for the chemists to present their recent research findings and to explore new avenues of collaborative research at both national and international levels.
  - (b) The “15<sup>th</sup> Nuclear Magnetic Resonance Spectroscopy (NMRS) Meeting on Magnetic Resonance and Biomolecular Mimetics” was held in Hyderabad, India, from 2 to 5 February 2009. The meeting attracted participation from research groups from national laboratories, universities, and pharmaceutical industries, and facilitated an interactive platform for discussions on the fundamental and advanced aspects of NMR spectroscopy and imaging. Assistance was provided by the OPCW through the Conference-Support Programme to meet the administrative costs of publication of the proceedings of the meeting.

- (c) Two participants from the United States of America attended the “2<sup>nd</sup> Latin America Risk Assessment Workshop” in Águas de São Pedro, São Paulo, Brazil, from 21 to 28 March 2009. The workshop sought to offer Latin American toxicologists unique opportunities to broaden their knowledge and experience in the field of chemical risk assessment and to understand data-evaluation processes better. The workshop was based on 20 years of experience with the Risk Assessment Summer School (RASS), which has been sponsored by the International Union of Toxicology (IUTOX).
- (d) Six participants from Georgia, Iraq, Kenya, South Africa, Ukraine, and Zambia attended the “OPCW International Industry and Academic Workshop on CWC/BTWC/UNSC Res. 1540”, held in Dubrovnik-Cavtat, Croatia, from 4 to 5 April 2009 and the CBMTS-Industry VI: “Fifth World Congress on Chemical, Biological and Radiological Terrorism”, which was also held in Dubrovnik-Cavtat, Croatia, from 5 to 10 April 2009. The workshop, and the congress that followed, focused on the multiple problems of chemical, biological, and radiological (CBR) protection within the framework of the Convention.
- (e) Five participants from Argentina, Austria, Germany, Switzerland, and the United Kingdom of Great Britain and Northern Ireland were sponsored to attend the “XXI Croatian Meeting of Chemists and Chemical Engineers” in Split and Trogir, Croatia, held from 19 to 22 April 2009. The meeting provided a forum for discussion for scientists, engineers, managers, and other professionals involved in research and in teaching chemistry, as well as for participants who were involved in the chemical industry and in the trade in chemicals. The meeting also offered the participants an opportunity to strengthen existing professional contacts and to develop new ones.
- (f) Five participants from Albania, Armenia, Bulgaria, the Czech Republic, and Ireland attended the “Conference on Nano-Safety” in Ljubljana, Slovenia, held from 22 to 24 April 2009. The conference brought together stakeholders from Central and Eastern Europe, as well as from the Organisation for Economic Co-operation and Development (OECD) and European Union (EU) countries to exchange information on different policy approaches concerning the safety of nanomaterials.
- (g) Five participants from Botswana, Ghana (2), Sierra Leone, and South Africa received support that enabled them to participate in the “16<sup>th</sup> International Congress on Nitrogen Fixation”, held in Big Sky, Montana, the United States of America, from 14 to 19 June 2009. The congress sought to bring together researchers to discuss the chemistry, biochemistry, regulation, physiology, ecology, and evolution of the processes of nitrogen-fixation.
- (h) One participant from Belarus attended the “9<sup>th</sup> Mediterranean Conference on Calorimetry and Thermal Analysis”, which took place in Marseille, France, from 15 to 18 June 2009. The conference focused on finding solutions to Mediterranean issues related to the valorisation of natural resources; the preservation of soils, water, and air; and the use of solar energy. The main focus was on the International Thermonuclear Experimental Reactor (ITER)

project, which is being used to demonstrate the commercial feasibility of nuclear fusion as a source of power and has led to a special interest in the application of calorimetric or thermal analysis for studying the behaviour of materials under high temperature.

- (i) Fourteen participants from Australia, Botswana, Kenya, Lesotho, Morocco, New Zealand, Nigeria, South Africa, Sweden, Thailand, the United Republic of Tanzania, the United States of America, Zambia, and Zimbabwe attended the 3<sup>rd</sup> SEANAC<sup>1</sup> “Chemistry for Food Security and Sustainable Development” conference, held in Ezulwini, Swaziland, from 5 to 8 July 2009. The aims were to create awareness on the following: food security; nutrition and its impact on HIV/AIDS; environmentally friendly and sustainable development; current technologies in regard to food security; sustainable development; and building capacity and promoting research on food security within the region.
- (j) Two participants from Algeria attended the “13<sup>th</sup> IUPAC International Conference on Polymers and Organic Chemistry (POC-’09)” held in Montreal, Canada, from 5 to 9 July 2009. The conference brought together scientists working in the area of natural and synthetic polymers and their applications, with special attention being paid to new methods in polymer synthesis, bio-related polymers, electroactive and photoactive polymers, and functional materials for various industrial applications. It also served as a platform for representatives from business and academia to exchange ideas, observe current trends, and present research results in their areas of expertise.
- (k) Two participants from Madagascar and Rwanda attended the “13<sup>th</sup> Symposium of the Natural Products Research Network for Eastern and Central Africa” (NAPRECA), held in Kinshasa, the Democratic Republic of the Congo, from 10 to 14 August 2009. The participating scientists discussed different aspects of natural-products research in East and Central Africa and explored the possibilities of potential collaboration.
- (l) Five participants from Bangladesh, Indonesia, the Philippines, Thailand, and Viet Nam, attended the “10<sup>th</sup> Asian Conference on Analytical Sciences (ASIANALYSIS X)” at the Putra World Trade Centre, Kuala Lumpur, Malaysia, from 11 to 13 August 2009. The goals of the conference were to hold discussions on the latest developments in the field of analytical sciences, to promote best practices and efficiency, and to enhance cooperation and collaboration in research between analytical chemists in the Asia Pacific region and the rest of the world.
- (m) Three participants from Azerbaijan, Bulgaria, and Morocco attended the “25<sup>th</sup> European Crystallographic Meeting (ECM25)”, held in Istanbul, Turkey, from 16 to 21 August 2009. The meeting brought together crystallography scientists from Europe, the Middle East, and North Africa. The meeting covered topics related to the science of crystallography, including biological

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SEANAC = Southern and Eastern African Network for Analytical Chemists

and macromolecular crystallography, materials and minerals, chemical crystallography, and fundamental crystallography.

- (n) Eight participants from seven Member States—Belarus, Malawi, Pakistan, Poland, the Russian Federation (2), Thailand, and Ukraine—attended the “31<sup>st</sup> International Conference on Solution Chemistry” (ICSC) held in Innsbruck, Austria, from 21 to 25 August 2009. The main aims of the conference were to provide a highly interdisciplinary forum covering multiple branches of contemporary chemistry and to increase awareness of the interrelationships of the various chemistry disciplines.
- (o) A participant from the Russian Federation attended the “EMLG-JMLG Annual Meeting 2009 on Intermolecular Interactions and Liquid Structure”, held in Salzburg, Austria, from 6 to 10 September 2009. The aim was to present the most recent advances in the field of molecular liquid systems.
- (p) Five participants from Botswana, Canada, the Islamic Republic of Iran, Tunisia, and the United Republic of Tanzania attended the “7<sup>th</sup> Congress of Toxicology in Developing Countries”, the theme of which was the “Harmonization of Toxicological Issues between Developing and Developed Countries”, which was held in Sun City, South Africa, from 6 to 10 September 2009. The Congress contributed to enhancing human-resources skills in relation to developing an understanding of how toxic substances should be managed. Participating toxicologists were encouraged to create an international network to facilitate cross-country collaboration in chemical-risk assessments. The participants also discussed how to promote awareness of chemical safety to local authorities.
- (q) Three participants from China, Slovenia, and the United Kingdom of Great Britain and Northern Ireland attended the “CleanUp 09” conference. The event combined the “5<sup>th</sup> International Workshop on Chemical Bioavailability in the Environment” (24 and 25 September) and the “3<sup>rd</sup> International Contaminated Site Remediation Conference” (27 to 30 September) and was held in Adelaide, Australia. The Conference provided information on the analytical techniques being used for the detection of toxic chemicals in the environment; on the exchange of innovative research knowledge on toxic and hazardous chemicals being released into the environment; on risks associated with toxic substances; on risk assessment and management; and on the development of innovative and cost-effective techniques for the destruction and/or remediation of toxic materials. The meeting brought together experts in toxic substances and contamination research and in environmental remediation and environmental-protection policy.
- (r) Nationals of five Member States—Australia, Kenya, South Africa, the United Kingdom of Great Britain and Northern Ireland, and the United States of America—took part in the “International Symposium of Molecular Environmental Soil Science at the Interfaces in the Earth’s Critical Zone (ISMESS 2009)”, held in Hangzhou, China, from 10 to 14 October 2009. The main emphasis of the symposium was the provision of a forum for soil chemists, mineralogists, microbiologists, and physicists to discuss and

promote future research on soil processes at the interfaces at the molecular level and to promote education in this area of science.

- (s) Participants from nine countries—Cameroon, Ethiopia, Ghana, Kenya, Lesotho, Malawi, Nigeria, the Sudan, and Zimbabwe—attended the “International Conference on Environmental Pollution and Toxicology in Africa: Status and Strategies for Sustainable Environmental Quality”, which was held in Kampala, Uganda, from 2 to 5 November 2009. The conference was organised to provide a forum to discuss the continent’s status with respect to pollutants, the toxicology and strategies for sustainable environmental quality, as well as to lay strategies to mitigate environmental-risk factors in Africa.
- (t) Seven participants from five Member States—Iraq (2), the Islamic Republic of Iran (2), Saudi Arabia, Turkey, and the United States of America—took part in “Frontiers of Chemical Sciences IV: Research and Education in the Middle East. A Bridge to Peace and International Development (Malta IV)”, held in Amman, Jordan, from 14 to 19 November 2009. The aim of this meeting was to continue to build upon the three earlier meetings and to develop and carry out recommendations for further scientific interactions, including representations and recommendations to national governments.
- (u) Participants from four African Member States—Cameroon, Côte d’Ivoire, Senegal, and Togo—attended the “18<sup>th</sup> Biennial Meeting and Scientific Conference of the African Association of Insect Scientists” (AAIS) in Ouagadougou, Burkina Faso, from 16 to 20 November 2009. The meeting was organised to provide an opportunity for scientists working in the field of entomology to exchange experiences, and to discuss the results of studies carried out during the previous year and what actions should be undertaken to face new challenges in relation to insect-control methods.
- (v) Seven participants from Argentina (3), France, Germany (2), and the United States of America attended the workshop entitled “Strategies to Define Environmental Criteria for Protection of Human Health and the Ecosystem: Chemical Substances”, which took place in São Paulo, Brazil, from 16 to 20 November 2009. The workshop provided a forum for discussions and an opportunity for the development of strategies to define environmental criteria for protection of human health and the ecosystem. The meeting launched a multi-agency project that includes a permanent working group to propose standardised protocols to derive environmental criteria for Latin America.
- (w) Three participants from Belgium (2) and Ireland took part in the “10<sup>th</sup> International Symposium on Kinetics in Analytical Chemistry”, held in Cape Town, South Africa, from 2 to 4 December 2009. The symposium brought together international experts on this subject. The event also facilitated collaboration between South African, African, and international scientists in regard to common research topics.

- (x) Twenty-five Asian participants from Bangladesh, China (4), India (4), Indonesia (5), Malaysia, Mongolia, Nepal (2), Pakistan, the Philippines, Sri Lanka (2), and Viet Nam (3) received financial support to attend the “Chemistry in Nature and Natural Resources” workshop organised by the OPCW and the International Foundation for Science (IFS), which was held in Chiang Mai, Thailand, from 7 to 10 December. The workshop highlighted important research issues on the following three themes: the chemistry of natural resources; natural resources with the potential to be used for human health; and chemicals and the environment. The workshop also sought to follow up the career and research paths of researchers in Asia who had received joint OPCW/IFS research grants under the OPCW Programme for Support of Research Projects, and enabled both the OPCW and the IFS to assess the impact that joint support was having. It further provided an opportunity for former and current OPCW/IFS grantees from various research disciplines and institutions in Asia to present their latest results, discuss challenges within their areas of research, and to engage in networking and discussions with other researchers.
- (y) Fourteen participants from Botswana (2), Kenya (4), Lesotho, the Sudan, Tanzania (4), Uganda, and Zimbabwe, attended the “8<sup>th</sup> Training and Workshop of the East and Southern Africa Laboratory Managers Association”, held in Addis Ababa, Ethiopia, from 7 to 11 December 2009. The purpose of this workshop was to improve the participants’ laboratory-testing and calibration skills in order that they could contribute to the formation of an accreditation body in the region, to the growth of inter-laboratory testing services, and to the implementation of good laboratory practices.
- (z) Four participants from Chile, India, Indonesia, and the Russian Federation attended the “Joint 6<sup>th</sup> Singapore International Symposium on Protection Against Toxic Substances (6<sup>th</sup> SISPAT) and 2<sup>nd</sup> International Chemical, Biological, Radiological and Explosives Operations Conference (2<sup>nd</sup> ICOC)”, organised at the Raffles City Convention Centre, Singapore, from 8 to 11 December 2009. These events were organised to promote the sharing of technical and professional knowledge amongst the scientific community in relation to protection against chemical and biological weapons. The SISPAT is an operational-technical forum designed to foster the interaction of scientists, physicians, military planners, and other professionals from government, academia, and industry sectors to share the latest knowledge and experiences in regard to defence against unconventional threats.

### **Internship-Support Programme**

- 2.12 The Internship-Support Programme assists scientists and engineers from countries 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 Member States. A key objective of this Programme is to facilitate the exchange of scientific and technical information, while strengthening the institutions in the targeted countries through capacity building. A table containing details of internships carried out in 2009 is provided in Annex 2 (and has been alphabetised according to the State Party of the interns).



- 2.13 During the period under review and in support of the Africa Programme, a generous voluntary contribution from the Government of the Netherlands enabled the Secretariat, in cooperation with Delft University of Technology, in Delft, the Netherlands, to offer two six-month internships at the university's ChemTech Department. A Nigerian national at the Delft University of Technology is conducting research on "Geopolymer, a new cement with low CO<sub>2</sub> emissions". The internship is currently under way, having started on 16 November 2009, and will be completed on 15 May 2010.
- 2.14 The Republic of Korea provided a generous voluntary contribution to support two internships, also under the Africa Programme.
- (a) A Ghanaian national at the Swiss Federal Institute of Technology Zurich (Institute for Chemical and Bioengineering), Safety & Environmental Technology Group in Zurich, Switzerland, conducted research on "Modelling the environmental fate of lindane of Lake Bosumtwi in Ghana". The internship took place from 1 November 2009 to 31 January 2010.
  - (b) A Nigerian national at the Department of Soil and Crop Sciences at the Colorado State University in the United States of America carried out research on "Fly ash/brine interaction: partitioning of metals in the resulting solid residues". The internship started on 16 November 2009 and will end on 17 February 2010.
- 2.15 During the period under review, under a "Training Programme on Chemical Engineering for African Countries", China provided a generous voluntary contribution that enabled a Tanzanian national to take up a six-month internship at the Beijing University of Chemical Technology in Beijing, China. The internship is currently under way and will end on 15 March 2010.
- 2.16 The other internships that were supported by the OPCW during the period under review (in alphabetical order of the participants' nationality) were: a Burkina Faso national at Lebensmittelversuchsanstalt (LVA) GmbH in Vienna, Austria; an Ecuadorian national at the Swedish University of Agricultural Sciences in Uppsala, Sweden; a Kenyan national at the Department of Chemistry at the Tshwane University of Technology in Pretoria, South Africa; a Kenyan national at the University of the Free State, QwaQwa, South Africa; a Madagascar national at University of Kwa Zulu Natal in Durban, South Africa; a Nigerian national at the Faculty of Natural Science, SensorLab Chemistry Department, University of the Western Cape, Bellville, South Africa; a Nigerian national at the Tshwane University of Technology in Pretoria, South Africa; a Nigerian national at the Department of Chemistry, Rhodes University, Grahamstown, South Africa; a Paraguayan national at the Spiez Laboratory in Switzerland; a Serbian national at the Geological Survey of Denmark and Greenland in Copenhagen, Denmark; a Trinidad and Tobago national at the Faculty of Natural Science, SensorLab Chemistry Department, University of the Western Cape, Bellville, South Africa; a Ugandan national at the Environment Canada, Canada Centre for Inland Waters, Aquatic Ecosystem Protection Research Division, in Burlington, Canada; and a Vietnamese national at the Finnish Institute for the Verification of the Chemical Weapons Convention (VERIFIN) in Helsinki,

Finland. Additionally, eight internships, which had started at the end of 2008, were concluded in 2009.

### **Programme for Support of Research Projects**

- 2.17 Under this Programme, support is extended for small-scale research projects in countries whose economies are developing or in transition, 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.
- 2.18 Under the period under review, the OPCW provided direct funding for eight new research projects by nationals from Indonesia, Nigeria (2), Pakistan, South Africa (3), and Uruguay.
- 2.19 The OPCW also co-funded 21 new research projects with the Stockholm-based International Foundation for Science (IFS), a non-governmental organisation (NGO) that supports capacity building in relation to applied scientific research in developing countries. Details of these projects are given in Annex 3.

### **Laboratory-Assistance Programme**

- 2.20 The objective of this Programme, an important element in the implementation of Article XI of the Convention, is to support analytical laboratories in countries whose economies are either developing or in transition, which already have adequate infrastructure, but wish to improve their technical capabilities to strengthen their national capacity for chemical analysis and monitoring.
- 2.21 Under the Programme, three technical personnel from the National Veterinary Laboratory (NVL) in Botswana were given customised training, from 23 November to 18 December 2009, by the Laboratory of the Government Chemist (LGC) at Teddington in the United Kingdom of Great Britain and Northern Ireland. The purpose of the training was to increase their competence in liquid chromatography-gas spectrometry (LC-MS) and multi-residue analyses to meet customer requirements for export purposes.
- 2.22 The OPCW also supported the course on the “Running and Interpretation of GC-MS Spectra”, held at the Department of Chemistry at the Jomo Kenyatta University of Agriculture and Technology, Nairobi, Kenya, from 2 to 6 March 2009 for 25 participants drawn from seven different African countries. Additional support was extended by the OPCW to three analytical chemists from Botswana, Ghana, and Zimbabwe to attend the course. The course was run as collaboration between the Pan-African Chemistry Network (PACN) and the Royal Society of Chemistry (United Kingdom of Great Britain and Northern Ireland).
- 2.23 Other laboratories that provided assistance under the Laboratory-Assistance Programme in 2009 were: Instituto de Química at the Universidad Nacional de Rosario in Rosario, Argentina; the Department of Chemistry, Escuela Politécnica

Nacional, Ecuador; the Customs Laboratory, Ecuador; Department of Chemistry at the Catholic University, Ecuador; and Escuela Politécnica del Ejército, Ecuador.

### **Analytical-Skills-Development Courses**

- 2.24 During the period under consideration, a two-week “Analytical-Skills-Development Course” was conducted at VERIFIN, in Helsinki, Finland, from 29 May to 12 June 2009. From a large number of applications from Member States, the Secretariat selected for participation 20 qualified chemists from Argentina, Bangladesh, Belarus, Botswana, Costa Rica, Grenada, Honduras, Indonesia, Jamaica, Jordan, Kenya, the Libyan Arab Jamahiriya, Malaysia, Morocco, Pakistan, Serbia, Sri Lanka, Tunisia, Uganda, and Zambia. The main objectives of the course were to enhance the ability of participants to analyse chemicals related to the national implementation of the Convention, to enhance national capacities in areas relating to analytical chemistry, to facilitate the adoption of good laboratory practices, and to increase the pool of human resources upon which the National Authorities and the Secretariat can draw in the future.
- 2.25 The Secretariat, in collaboration with Protechnik Laboratory in Pretoria, South Africa, and VERIFIN, developed a “Basic Analytical Chemistry Course” for the Africa Programme. This course took place for the first time from 23 March to 3 April 2009 in Pretoria, South Africa. It involved 12 participants from 11 countries: Algeria, Botswana (2), Burkina Faso, Ghana, Kenya, the Libyan Arab Jamahiriya, Mauritius, Morocco, Nigeria, Tunisia, and Uganda. Two additional participants from the Protechnik Laboratory, who are involved in the OPCW proficiency-testing scheme, also completed the course.
- 2.26 A two-week “Course on the Enhancement of Laboratory Skills in Using Liquid Chromatography-Mass Spectrometry to Analyse Chemicals Related to the Chemical Weapons Convention (CW-LSE)” was held at VERIFIN, Helsinki, Finland, from 7 to 18 September 2009. The course aimed to enhance the skills of the participants in regard to the analysis of chemicals related to the national implementation of the Convention and the national capacities in the Member States by offering training in analytical chemistry to personnel from the chemical industry, academic institutions, and government laboratories. Analytical chemists from Brazil, China, and South Africa participated in this event.
- 2.27 Upon a request from the National Authority of Indonesia, the Secretariat organised a pilot training course on sample preparation and trace analysis of compounds related to the Convention, together with the Indonesian Institute of Science, Research Centre for Chemistry, in West Java. This was a new initiative, implemented at the national level with support from an international expert and local analytical chemists, who had previously participated in OPCW-run analytical-skills-development courses. Altogether, 31 young scientists benefited from this course.

### **Industry Outreach**

- 2.28 The industry-outreach seminars are the newest activity related to the implementation of Article XI; these seminars are organised in order to strengthen international

cooperation through programmes that focus on chemical-industry outreach and industry-related aspects of the implementation of the Convention.

- 2.29 The “Seminar on the Chemical Weapons Convention and Chemical Process Safety Management for States Parties in the South-East and East Asian Region” was organised by the OPCW, together with the generous support from the Government of Japan, and took place in Tokyo, Japan, on 11 and 12 November 2009.
- 2.30 The goal was to provide a platform for States Parties to consider and discuss specific safety-management issues related to chemical processes that have a direct bearing on the effective implementation of the Convention. It also contributed to the exchange and sharing of experiences on the practical implementation of safety-management programmes.
- 2.31 The seminar was attended by 19 participants from 10 countries: Bangladesh, China (2), India (2), Malaysia (2), Mongolia (2), the Philippines (3), the Republic of Korea (2), Sri Lanka, Thailand (2), and Viet Nam (2), who represented the chemical industry and governmental institutions.
- 2.32 The second event, a new initiative in the field of chemical-safety management for the African region, was launched with the generous support of the Government of Germany, at the Bergische University of Wuppertal, Germany. The course, “Promoting Chemical-Safety Management for States Parties in Africa”, was held from 16 to 20 November 2009.
- 2.33 A total of 10 participants from Côte d’Ivoire, Ghana, Kenya, Mauritius, Mozambique, Nigeria, South Africa, the Sudan, Uganda, and Zimbabwe successfully completed the course.
- 2.34 The overall evaluation of the industry-outreach courses, conducted through questionnaires completed by participants, was that both courses had been successful and very useful. The participants felt they had greatly benefited and had learned a great deal. The discussions confirmed the need for national capacity building and the importance of raising awareness in Member States on the culture of safety management; it also emphasised the value of training and of the exchange of scientific knowledge to promote best practices in the chemical sectors.

### **Equipment-Exchange Programme**

- 2.35 This Programme facilitates the transfer of used equipment that is still functional from institutions in industrialised countries to publicly funded research and/or academic laboratories or other institutions in countries whose economies are developing or in transition. Support consists of grants to meet the costs of transporting the equipment from the donor to the recipient, insuring the equipment in transit, and where necessary, of an expert’s appraisal on the condition and functionality of the equipment and training.
- 2.36 Under this Programme, which supports the voluntary transfer of laboratory equipment, assistance was extended to Ethiopia and Malawi. In addition, laboratory equipment was transferred to an institution in the Netherlands. The support consisted

of a grant to meet the costs of transporting the equipment from the donor to the recipient institutions and supporting the travel of a trainer from the donor institution to train users at the recipient institution in the use of the equipment. In addition, 10 computers were received from the China as voluntary contribution, and were transferred to nine Member States in Africa—namely, to Burkina Faso (2), Burundi, Cameroon, the Congo, Ethiopia, Liberia, Nigeria, Uganda, and Zambia.

### **Information Service**

- 2.37 During the reporting period, the Information Service continued to provide information, upon request, to Member States and their institutions on the properties of chemicals and the contact details of both suppliers and producers of chemicals and chemical technologies. The Secretariat has access to the on-line services of the Science and Technology Network, which enables it to respond quickly and effectively to requests for information. National Authorities are encouraged to inform national institutions and enterprises on the availability of this service. Requests for information can be made directly to the Secretariat or through the National Authority concerned.

### **OPCW Programme to Strengthen Cooperation with Africa (the “Africa Programme”)**

- 2.38 The Africa Programme devises activities and interventions to respond to the particular needs of African Member States. Activities under the Programme have also included high-level bilateral visits and other actions to increase awareness of the Convention in Africa; cooperation with the African Union (AU); and outreach to civil society and academic institutions. Further details about this Programme can be found in C-14/DG.12, dated 18 November 2009.
- 2.39 The following activities in 2009 have contributed towards the implementation of the Africa Programme:
- (a) Twelve out of 17 individuals supported under the Internship-Support Programme were from African Member States: one was supported through a voluntary contribution from the Government of China; one from a voluntary contribution from the Government of the Netherlands; and two through a voluntary contribution from the Republic of Korea.
  - (b) Twelve researchers (from a total of 29 research projects) were from African Member States.
  - (c) The Associate Programme in 2009 once again accommodated more participants under the Africa Programme. Fifteen out of 28 participants of the Associate Programme were from African Member States.
  - (d) Analytical-skills-development courses, including the Laboratory-Skills Enhancement Course, were successfully completed by a total of eight participants from Africa.

- (e) Six participants from Africa successfully completed the training under the Laboratory-Assistance Programme held in 2009: three at the Department of Chemistry, University of Nairobi in Kenya; and three at the LGC in Teddington, the United Kingdom of Great Britain and Northern Ireland, respectively.
- (f) The Secretariat, in collaboration with Protechnik Laboratory in Pretoria, South Africa, and VERIFIN, held an annual “Basic Analytical Chemistry Course” for the Africa Programme. This course took place for the first time from 23 March to 3 April 2009 in Pretoria, South Africa. It involved 12 participants from 11 countries: Algeria, Botswana (2), Burkina Faso, Ghana, Kenya, the Libya Arab Jamahiriya, Mauritius, Morocco, Nigeria, Tunisia, and Uganda.
- (g) Industry outreach to support safety in chemicals management, especially in relation to the Convention, is an important new initiative in the framework of international cooperation. The course, “Promoting Chemical-Safety Management for States Parties in Africa”, held at the Bergische University of Wuppertal, Germany, from 16 to 20 November 2009, brought together 10 chemical industry and safety experts from African Member States (Côte d’Ivoire, Ghana, Kenya, Mauritius, Mozambique, Nigeria, South Africa, the Sudan, Uganda, and Zimbabwe) to receive technical training in safety management.

### **Cooperation with other organisations**

#### International Foundation for Science

- 2.40 The Secretariat continued to cooperate with the Stockholm-based IFS, an NGO that supports capacity building in developing countries in sciences related to applied chemistry and the sustainable management of biological and water resources. In 2009, the IFS and OPCW co-funded 21 new projects in various fields relating to the application of chemistry for purposes not prohibited under the Convention. These research projects are being supported in Benin, China, Cuba, Indonesia, Iraq, Kenya, Madagascar, Malaysia, Mali, Nepal, Nigeria, Paraguay, the Philippines, Thailand, Uganda, and Viet Nam.
- 2.41 During the year under review, the OPCW and the IFS held the third of a series of regional workshops; the first was held in Nairobi, Kenya, in 2006; and the second in Montevideo, Uruguay, in 2008. The third workshop was held in Chiang Mai, Thailand, from 7 to 10 December 2009, and highlighted important research issues within three thematic sessions: the chemistry of natural resources; natural resources with the potential to benefit human health; and chemicals and the environment.

#### Finnish Institute for the Verification of the Chemical Weapons Convention

- 2.42 In 2009, the Secretariat, in partnership with VERIFIN, organised three courses. The first analytical-skills-development course took place at the University of Helsinki from 29 May to 12 June 2009. The course accommodated 20 participants from 20 Member States: Argentina, Bangladesh, Belarus, Botswana, Costa Rica, Grenada, Honduras, Indonesia, Jamaica, Jordan, Kenya, the Libyan Arab Jamahiriya, Malaysia, Morocco,

Pakistan, Serbia, Sri Lanka, Tunisia, Uganda, and Zambia. The course focused on the GC and GC-MS analysis of chemicals related to the national implementation of the Convention, and sought to enhance national capacities in the Member States by training personnel from the industry, academic institutions, and government laboratories.

- 2.43 The second analytical-skills-development course, entitled “Course on the Enhancement of Laboratory Skills in Using Liquid Chromatography-Mass Spectrometry to Analyse Chemicals Related to the Chemical Weapons Convention (CW-LSE)”, was held at VERIFIN, Helsinki, Finland, from 7 to 18 September 2009. The course aimed to facilitate the analysis of chemicals related to the national implementation the Convention and to enhance national capacities in the Member States.
- 2.44 The third course organised by OPCW in collaboration with VERIFIN and the Protechnik Laboratory in Pretoria, South Africa, was the pilot Basic Analytical Chemistry Course under the Africa Programme, which accommodated 12 participants from 11 Member States.
- 2.45 As in previous years, under the Internship-Support Programme, the Secretariat continued to support internships at the Spiez Laboratory in Switzerland, at VERIFIN in Finland, and at the Delft University of Technology in Delft, the Netherlands.

#### **Review of existing regulations in the field of trade in chemicals**

- 2.46 The “Plan of Action regarding the Implementation of Article VII Obligations”, which was adopted by the Conference of the States Parties at its Eighth Session (C-8/DEC.16, dated 24 October 2003), urges States Parties that have not yet done so to review their existing regulations in the field of trade in chemicals in order to render them consistent with the object and purpose of the Convention.
- 2.47 Throughout the period under review, as in the other years since the Article VII plan of action was adopted, the Secretariat raised this issue with States Parties during technical-assistance visits (TAVs) and also in the margins of other meetings.
- 2.48 To facilitate reporting by States Parties in regard to this issue, a question (question 9) on subparagraphs 2(c), (d), and (e) of Article XI was included in the “Questionnaire on the Implementation of Trade Measures under the Chemical Weapons Convention” (Annex to S/440/2004, dated 23 August 2004). The responses to that question, together with those to the version of the question that appeared in the first legislation questionnaire (“Survey of National Measures to Regulate Scheduled Chemicals under the Chemical Weapons Convention” (Annex to S/194/2000, dated 8 June 2000)) and the submissions received by the Secretariat in respect to the Article VII plan of action, show that, as at 9 December 2009, out of 188 States Parties:
  - (a) sixty-three States Parties (34%) have completed the review and found their regulations consistent with the Convention;
  - (b) three States Parties (2%) are amending their legislation as a result of their review of their existing legislation;

- (c) eighteen States Parties (10%) are carrying out the above-mentioned review; and
- (d) one hundred and four States Parties (55%) have provided no information on the matter, or have indicated that they have not begun their review of their legislation related to the implementation of Article VII.

Annexes (English only):

- Annex 1: Conference-Support Programme (2009)
- Annex 2: Internship-Support Programme: Projects Conducted in 2009
- Annex 3: Research Projects Funded Directly by the OPCW in 2009 and Research Projects Funded Jointly by the International Foundation for Science and the OPCW in 2009



## Annex 1

### CONFERENCE-SUPPORT PROGRAMME (2009)

	Conference Title	Location	Duration	State Party of Sponsored Participants	Number of Sponsored Participants
1	Bangladesh Chemical Congress 2008	Dhaka, Bangladesh	30 January to 1 February 2009	Germany (1), India (1), Italy (1), Nepal (1), the Republic of Korea (1), and the United Republic of Tanzania (1)	6
2	15 <sup>th</sup> Nuclear Magnetic Resonance Spectroscopy (NMRS) Meeting on Magnetic Resonance and Biomolecular	Hyderabad, India	2 to 5 February 2009	Financial support for the event only	n/a
3	2 <sup>nd</sup> Latin America Risk Assessment Workshop	Águas de São Pedro, São Paulo, Brazil	21 to 28 March 2009	United States of America (2)	2
4	OPCW International Industry and Academic Workshop on CWC/BTWC/UNSC Res. 1540  Industry VI: Fifth World Congress on Chemical, Biological and Radiological Terrorism	Dubrovnik-Cavtat, Croatia	4 to 5 April and  5 to 10 April 2009	Georgia (1), Iraq (1), Kenya (1), South Africa (1), Ukraine (1), and Zambia (1)	6
5	XXI Croatian Meeting of Chemists and Chemical Engineers	Split and Trogir, Croatia	19 to 22 April 2009	Argentina (1), Austria (1), Germany (1), Switzerland (1), and the United Kingdom of Great Britain and Northern Ireland (1)	5
6	Conference on Nano-Safety	Ljubljana, Slovenia	22 to 24 April 2009	Albania (1), Armenia (1), Bulgaria (1), the Czech Republic (1), and Ireland (1)	5
7	16 <sup>th</sup> International Congress on Nitrogen Fixation	Big Sky, Montana, United States of America	14 to 19 June 2009	Botswana (1), Ghana (2), Sierra Leone (1), and South Africa (1)	5
8	9 <sup>th</sup> Mediterranean Conference on Calorimetry and Thermal Analysis	Marseille, France	15 to 18 June 2009	Belarus (1)	1

	Conference Title	Location	Duration	State Party of Sponsored Participants	Number of Sponsored Participants
9	3 <sup>rd</sup> SEANAC Chemistry for Food Security and Sustainable Development	Ezulwini, Swaziland	5 to 8 July 2009	Australia (1), Botswana (1), Kenya (1), Lesotho (1), Morocco (1), New Zealand (1), Nigeria (1), South Africa (1), Sweden (1), Thailand (1), the United Republic of Tanzania (1), the United States of America (1), Zambia (1), and Zimbabwe (1)	14
10	13 <sup>th</sup> IUPAC International Conference on Polymers and Organic Chemistry (POC-'09)	Montreal, Canada	5 to 9 July 2009	Algeria (2)	2
11	13 <sup>th</sup> Symposium of the Natural Products Research Network for Eastern and Central Africa (NAPRECA)	Kinshasa, the Democratic Republic of the Congo	10 to 14 August 2009	Madagascar (1) and Rwanda (1)	2
12	10 <sup>th</sup> Asian Conference on Analytical Sciences (ASIANALYSIS X)	Kuala Lumpur, Malaysia	11 to 13 August 2009	Bangladesh (1), Indonesia (1), the Philippines (1), Thailand (1), and Viet Nam (1)	5
13	25 <sup>th</sup> European Crystallographic Meeting (ECM25)	Istanbul, Turkey	16 to 21 August 2009	Azerbaijan (1), Bulgaria (1), and Morocco (1)	3
14	31 <sup>st</sup> International Conference on Solution Chemistry (ICSC)	Innsbruck, Austria	21 to 25 August 2009	Belarus (1), Malawi (1), Pakistan (1), Poland (1), the Russian Federation (2), Thailand (1), and Ukraine (1)	8
15	The EMLG-JMLG Annual Meeting 2009 on Intermolecular Interactions and Liquid Structure	Salzburg, Austria	6 to 10 September 2009	The Russian Federation (1)	1
16	7 <sup>th</sup> Congress of Toxicology in Developing Countries: Harmonization of Toxicological Issues Between Developing and Developed Countries	Sun City, South Africa	6 to 10 September 2009	Botswana (1), Canada (1), the Islamic Republic of Iran (1), Tunisia (1), and the United Republic of Tanzania (1)	5
17	CleanUp 09 Conference, combining: The 5 <sup>th</sup> International Workshop on Chemical Bioavailability in the Environment and the 3 <sup>rd</sup> International Contaminated Site Remediation Conference	Adelaide, Australia	24 and 25 September 2009; and 27 to 30 September 2009	China (1), Slovenia (1), and the United Kingdom of Great Britain and Northern Ireland (1)	3

	<b>Conference Title</b>	<b>Location</b>	<b>Duration</b>	<b>State Party of Sponsored Participants</b>	<b>Number of Sponsored Participants</b>
18	International Symposium of Molecular Environmental Soil Science at the Interfaces in the Earth's Critical Zone (ISMESS 2009)	Hangzhou, China	10 to 14 October 2009	Australia (1), Kenya (1), South Africa (1), the United Kingdom of Great Britain and Northern Ireland (1), and the United States of America (1)	5
19	International Conference on Environmental Pollution and Toxicology in Africa: Status and Strategies for Sustainable Environmental Quality	Kampala, Uganda	2 to 5 November 2009	Cameroon (1), Ethiopia (1), Ghana (1), Kenya (1), Lesotho (1), Malawi (1), Nigeria (1), the Sudan (1), and Zimbabwe (1)	9
20	Frontiers of Chemical Sciences IV: Research and Education in the Middle East. A Bridge to Peace and International Development (Malta IV)	Amman, Jordan	14 to 19 November 2009	Iraq (2), the Islamic Republic of Iran (2), Saudi Arabia (1), Turkey (1), and the United States of America (1)	7
21	18 <sup>th</sup> Biennial Meeting and Scientific Conference of the African Association of Insect Scientists (AAIS)	Ouagadougou, Burkina Faso	16 to 20 November 2009	Cameroon (1), Côte d'Ivoire (1), Senegal (1), and Togo (1)	4
22	Strategies to Define Environmental Criteria for Protection of Human Health and the Ecosystem: Chemical Substances	São Paulo, Brazil	16 to 20 November 2009	Argentina (3), France (1), Germany (2), and the United States of America (1)	7
23	10 <sup>th</sup> International Symposium on Kinetics in Analytical Chemistry	Cape Town, South Africa	2 to 4 December 2009	Belgium (2) and Ireland (1)	3
24	Chemistry in Nature and Natural Resources	Chiang Mai, Thailand	7 to 10 December 2009	Bangladesh (1), China (4), India (4), Indonesia (5), Malaysia (1), Mongolia (1), Nepal (2), Pakistan (1), the Philippines (1), Sri Lanka (2), and Viet Nam (3)	25
25	8 <sup>th</sup> Training and Workshop of the East and Southern Africa Laboratory Managers Association	Addis Ababa, Ethiopia	7 to 11 December 2009	Botswana (2), Kenya (4), Lesotho (1), the Sudan (1), Tanzania (4), Uganda (1), and Zimbabwe (1)	14
26	Joint 6 <sup>th</sup> Singapore International Symposium on Protection Against Toxic Substances (6 <sup>th</sup> SISPAT) and the 2 <sup>nd</sup> International Chemical, Biological, Radiological and Explosives Operations Conference (2 <sup>nd</sup> ICOC)	Raffles City Convention Centre, Singapore	8 to 11 December 2009	Chile (1), India (1), Indonesia (1), and the Russian Federation (1)	4

## Annex 2

### INTERNSHIP-SUPPORT PROGRAMME: PROJECTS CONDUCTED IN 2009

	<b>Title of Project</b>	<b>Location of Internship</b>	<b>Duration</b>	<b>State Party of Intern</b>
1	Pesticides determination in food and environment samples	Lebensmittelversuchsanstalt (LVA) GmbH, Vienna, Austria	25 May – 17 August 2009	Burkina Faso
2	Antioxidant properties and phenolic composition of Ecuadorian fruits	Swedish University of Agricultural Sciences, Uppsala, Sweden	1 July – 30 September 2009	Ecuador
3	Modelling the environmental fate of lindane of Lake Bosumtwi in Ghana	Swiss Federal Institute of Technology Zurich (Institute for Chemical and Bioengineering), Safety & Environmental Technology Group, Zurich, Switzerland	1 November 2009 – 31 January 2010	Ghana
4	Biosorption of toxic metals using maize tassel for the determination, biosensing and removal of Hg (II) and Cd (II) from aqueous solutions	Tshwane University of Technology, Department of Chemistry, Pretoria, South Africa	1 February – 30 April 2009	Kenya
5	Synthesis and characterisation of cerium-doped silica	University of the Free State, QwaQwa, South Africa	1 October – 31 December 2009	Kenya
6	Biodiversity conservation through bioprospecting in Madagascar: research for bioactive compounds and phytochemical analysis of plants from Manombo	University of KwaZulu Natal, Durban, South Africa	3 September – 3 November 2009	Madagascar
7	Electrochemical nanosensors for real time determination of priority organic pollutants in industrial effluents	Faculty of Natural Science, SensorLab Chemistry Department University of Western Cape, South Africa	1 April – 30 June 2009	Nigeria
8	Determination of arsenic and mercury in water and food using hydride generation and atomic-absorption	Tshwane University of Technology, Faculty of Science, Department of Environment, Water and Earth Sciences, Pretoria, South Africa	1 October – 31 December 2009	Nigeria

	<b>Title of Project</b>	<b>Location of Internship</b>	<b>Duration</b>	<b>State Party of Intern</b>
9	Identification and quantification of alkylphenols in the environment	Department of Chemistry, Rhodes University, Grahamstown, South Africa	9 November 2009 – 31 January 2010	Nigeria
10	Fly ash/brine interaction: partitioning of metals in the resulting solid residues	Department of Soil and Crop Sciences, Colorado State University, United States of America	16 November 2009 – 17 February 2010	Nigeria
11	Geopolymer, a new cement with low CO <sub>2</sub> emissions	TU Delft, Delft, the Netherlands	16 November – 15 May 2010	Nigeria
12	Synthesis of compounds related to precursors, degradation and by-products of CW-agents	Spiez Laboratory, Switzerland	1 September – 30 November 2009	Paraguay
13	Organic geochemical characterization and correlation of oils from the South-Eastern part of the Pannonian Basin, Serbia	Geological Survey of Denmark and Greenland, Copenhagen, Denmark	1 October 2009 – 31 March 2010	Serbia
14	Novel metallodendrimeric complexes/nanomaterials for application in catalysis and fuel cells	Faculty of Natural Science, SensorLab Chemistry Department University of the Western Cape, Bellville, South Africa	8 June – 14 August 2009	Trinidad and Tobago
15	Analysis of persistent organic pollutants in Lake Victoria and their biomagnification in the fish food web	Environment Canada, Canada Centre for Inland Waters, Aquatic Ecosystem Protection Research Division, Burlington, Canada	6 July – 5 October 2009	Uganda
16	Training program on chemical engineering for African countries	Beijing University of Chemical Technology, Beijing, China	15 September 2009 – 15 March 2010	United Republic of Tanzania
17	Fast GC-MS	Finnish Institute for the Verification of the Chemical Weapons Convention, Helsinki, Finland	19 January – 18 May 2009	Viet Nam

**Annex 3****RESEARCH PROJECTS FUNDED DIRECTLY BY THE OPCW IN 2009**

	<b>Title</b>	<b>State Party of Researcher</b>
1	Determination of the presence of degradation products of sulphur mustard (HD) at the site previously used as its production, storage, and destruction areas	Indonesia
2	Chemotherapy of malaria and African trypanosomiasis: Exploring the therapeutic potentials of Nigerian medicinal plants	Nigeria
3	Developing environmentally friendly product treatments for post-harvest storage of grains and high-value crops as an alternative to ozone-depleting pesticides	Nigeria
4	Global search of antiepileptic constituents from <i>Delphinium</i> and <i>Aconitum</i> species	Pakistan
5	Sampling and sample preparation strategies for characterization, monitoring, and remedial studies of inorganic and organic pollutants	South Africa
6	Behaviour of maize tassel: A novel biosorbent, towards the development of a solid-phase extractor for the removal of toxic metals from aqueous solutions	South Africa
7	The development of a novel cytochrome C oxidase biosensor for early detection of asphyxiants with subsequent electrochemical destruction pathways	South Africa
8	Transforming pollutants into green energy: Biohydrogen production from industrial wastes	Uruguay

**RESEARCH PROJECTS FUNDED JOINTLY BY THE INTERNATIONAL FOUNDATION FOR SCIENCE AND THE OPCW IN 2009**

	<b>Title</b>	<b>State Party of Researcher</b>
1	Purification bioguidée et caractérisation des molécules antiparasitaires de deux plantes de la pharmacopée béninoise	Benin
2	Mobilization of aluminium in panax ginseng successive cropping soil and Al phytotoxicity on panax ginseng	China
3	Studies on the synthesis, characterization and properties of novel bionanocomposites derived from soybean oil and polyhedral oligomeric silsesquioxanes (POSS)	China
4	Phytoextraction of Cd-contaminated soil in southern China by <i>carambola</i>	China
5	Isolation and characterization of antimicrobial peptides from marine invertebrates	Cuba

	<b>Title</b>	<b>State Party of Researcher</b>
6	Fixed-bed column application of bioadsorbent of a humic acid-chitin hybrid for recovery and reuse of chromium in the effluent of tannery wastewater treatment	Indonesia
7	The effect of sludge stabilization times on the heavy metals removal in activated sludge units	Iraq
8	Removal of fluoride ions from aqueous solutions by a siliceous mineral of a Kenyan origin	Kenya
9	Mise en évidence de l'activité antidiabétique de <i>Kotschya Perrieri</i> sur différents modèles in vivo et in vitro (Fabaceae)	Madagascar
10	Structural diversity and antibacterial activity of novel halogenated metabolites from red algae genus <i>Laurencia</i> (Ceramiales, Rhodophyta) from the North Borneo coast	Malaysia
11	Étude de <i>Trichilia emetica</i> utilisée dans le traitement traditionnel des dysménorrhées au Mali	Mali
12	Production of xylanase from selective thermoactinomycetes isolated from the soils of Nepal and its purification and biochemical characterization	Nepal
13	Antipoliiovirus evaluation of ten medicinal plants identified from the Nigeria ethnobotany	Nigeria
14	Potentials of <i>Aspilia africana</i> leaf as an alternative growth promoter in poultry	Nigeria
15	Synthesis of a small library of hydrobenzyl derivatives bearing potential trypanocidal and leishmanicidal activity	Paraguay
16	Screening of the plant community in a waste disposal facility in Cebu City, Philippines for tolerance to toxic metals: Implications for future phytoremediation of metal-contaminated soils	The Philippines
17	Factors affecting growth and hydrocarbon content of four <i>Botryococcus braunii</i> strains isolated from lakes and freshwater ponds in Southern Thailand	Thailand
18	Isolation and characterization of mesophilic-thermophilic organic solvent-tolerant bacteria for biotechnological and environmental applications	Thailand
19	Use of bioindicators and biomarkers to assess aquatic environmental contamination in selected wetlands receiving urban runoff	Uganda
20	Evaluation of the chemical composition and nuclear factor kB activity of several plants in the genus <i>Eupatorium</i> growing in Viet Nam	Viet Nam
21	Synthesis of new 4-aminoquinoline and tetraoxane-based antimalarials	Viet Nam