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Fourth meeting
Bonn, 12-16 May 2008
Item 6 of the provisional agenda**

REPORT OF THE SECOND INTERNATIONAL MEETING OF ACADEMIC INSTITUTIONS AND ORGANIZATIONS INVOLVED IN BIOSAFETY EDUCATION AND TRAINING

Note by the Executive Secretary

I. INTRODUCTION

1. The Second International Meeting of Academic Institutions and Organizations Involved in Biosafety Education and Training was held 16-18 April 2007 in Kuala Lumpur. It was attended by a total of 63 participants from 56 institutions. The full list of participants is contained in annex III to this report.

2. The meeting was organized by the Secretariat of the Convention on Biological Diversity (CBD) and the United Nations Industrial Development Organization (UNIDO) with support from the Danish Government (through the BiosafeTrain project), the Swiss Government and the Biosafety Interdisciplinary Research Network (RIBios) based at the University of Geneva. It was hosted by the Government of Malaysia through the Ministry of Natural Resources and Environment and the University of Malaya.

3. Dato' Seri Azmi Khalid, the Minister of Natural Resources and Environment officially opened the meeting. In his remarks, Hon. Azmi Khalid underscored the need for continuous capacity building in biosafety commensurate with the rapid and evolving development of biotechnology. In particular, he highlighted the importance of formal training and teaching of biosafety. In this regard, he welcomed the efforts being made by different institutions, including the University of Malaya which had with the assistance of UNIDO and other partners, started a post-graduate diploma course in biosafety. He expressed the hope that the meeting would come up with recommendations that would help promote

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long-term education and training in biosafety and strengthen human resources capacities for the effective implementation of the Protocol, particularly in developing countries. Dato. Azmi Khalid also expressed hope that the meeting would provide a platform to increase South-South cooperation and North–South cooperation on academic training in biosafety in developing countries.

4. Opening remarks were also made by Prof. Dato' Amin Jalaluddin, representing the Vice-Chancellor of University of Malaya (Datuk Rafiah Salim), Mr. Charles Gbedemah, representative of the Secretariat of the Convention on Biological Diversity, and Dr. George Tzotzos, representative of UNIDO.

5. In his remarks, Prof. Jalaluddin reported that the University of Malaya recognized the need for disseminating knowledge and skills and understands the importance of supporting the effective implementation of the Cartagena Protocol on Biosafety. He invited the organizations and academic institutions present at the meeting to share their views and experiences in order to foster the strengthening of human resources in biosafety.

6. On behalf of the Executive Secretary of the Convention on Biological Diversity, Mr. Gbedemah thanked the Government of Malaysia for hosting the meeting. He also thanked the Governments of Denmark and Switzerland, UNIDO and RIBios for providing the financial support that enabled participants from developing countries and countries with economies in transition to attend the meeting. He commended the efforts being made by different governments and organizations in building capacities, in particular developing human resources for the effective implementation of the Protocol. He also underscored the need for coordinated and complementary efforts in promoting biosafety education and training. In order to train a cadre of experts in different countries, he urged participants to come up with concrete recommendations that would foster collaborative initiatives to promote the development of new academic programmes in biosafety and to strengthen existing ones.

7. Dr. Tzotzos highlighted the potential role of biotechnology in improving human well-being and the need to ensure that the technology is developed and used in a safe manner. He reported that it was in this context that UNIDO initiated the South-South Capacity Building Network for Biosafety Training. The aim of the network is to provide internationally accredited training in biosafety to policy makers, researchers and professionals in government agencies and industry. He reported that five nodes of the network (based at universities and one regional centre of excellence) had so far been established to offer regional 12-month postgraduate diploma and masters degree programmes delivered by a combination of on-campus residential teaching and distance learning technologies.

8. After the opening ceremony, participants elected Prof. Gurdial Singh Nijar (University of Malaya, Malaysia) to serve as Chairperson of the meeting and Dr. Sylvia Burssens (Ghent University, Belgium) to serve as Rapporteur.

9. The meeting adopted its agenda on the basis of the provisional agenda (UNEP/CBD/BS/CM-ET/2/1). It also adopted the organization of work as contained in the annotations to the provisional agenda (UNEP/CBD/BS/CM-ET/2/1/Add.1).

II. OBJECTIVES AND SCOPE OF THE MEETING

10. The main objective of the meeting was to identify ways and means of promoting long-term formal education and training in biosafety, pursuant to decisions BS III/3 (paragraph 11) and BS-III/11 (paragraphs 16 and 17) of the Conference of the Parties serving as the meeting of the Parties to the Cartagena Protocol on Biosafety (COP-MOP).

11. The following were the principal substantive items discussed:

(a) Strategies and mechanisms for enhancing formal education and training in biosafety, in particular the development and/or expansion of degree and diploma-granting programmes (item 4.1); and

(b) Measures for promoting South-South and North-South cooperation between institutions involved in biosafety education and training (item 4.2).

12. In addition, participants reviewed the progress made in implementing the conclusions and recommendations of the First Meeting of Academic Institutions and Organizations Involved in Biosafety Education And Training, which was held in Geneva from 4 to 6 October 2004 (item 3.1). They also considered the decisions of the Conference of the Parties serving as the meeting of the Parties to the Cartagena Protocol on Biosafety (COP-MOP) relating to biosafety education and training and exchanged views on how to effectively implement them (item 3.2).

13. Furthermore, participants made short presentations on their ongoing or planned biosafety education and training programmes and collaborative partnerships under agenda item 3.3. Written briefs, which were submitted prior to the meeting, were compiled and made available to all participants in an information document (UNEP/CBD/BS/CM-ET/2/INF/1). The meeting also heard detailed case study presentations on the experiences and lessons learned from the following initiatives. 1/

(a) UNIDO-supported South-South Capacity Building Network for Biosafety Training;

(b) The Biosafety Training Initiative in Francophone African Countries by the Biosafety Interdisciplinary Research Network (RIBios) based at the University of Geneva;

(c) The BiosafeTrain Project - Capacity Building for Biosafety and Ecological Impact Assessment of Transgenic Plants in East Africa;

(d) The UNESCO University Education Twinning and Networking Scheme (UNITWIN) and the Opportunities and Options for Establishing UNESCO Chairs and Networks in Biosafety;

(e) The GenØk course: Holistic Foundations for Assessment and Regulation of Genetic Engineering and Genetically Modified Organisms and the Cooperation in Biosafety Research and Training under the Gateways Institute Network; and

(f) Biosafety Training Activities under the Program for Biosafety Systems (PBS).

14. The substantive agenda items of the meeting (i.e. items 4.1 and 4.2) were discussed concurrently in three focus groups that were established. The following questions formed the basis of the focus group discussions:

(a) What actions/mechanisms are needed to develop and/or expand academic programmes that focus on training biosafety professionals at the degree/diploma level?

(b) What regional activities/processes and mechanisms can facilitate the development and delivery of academic programmes in biosafety?

1/ Copies of the information document and the case study presentations are available on the CBD website at: http://www.biodiv.org/doc/meeting.aspx?mtg=BETAIO-02

(c) What global activities/processes and mechanisms can facilitate the development and delivery of academic programmes in biosafety?

III. GENERAL OBSERVATIONS, CONCLUSIONS AND RECOMMENDATIONS

A. Report of the First Meeting of Academic and other Institutions Offering Biosafety Education and Training Programmes, 2-3 October 2004, Geneva

15. Under agenda item 3.1, participants reviewed the recommendations of the first meeting, in particular the common format for the Compendium of Academically Accredited Courses and the Biosafety Training Needs Matrix contained in Annexes II and IV of the report of the first meeting (contained in document UNEP/CBD/BS/COP-MOP/2/INF/9).

16. The following comments and suggestions were made with respect to the compendium:

(a) The primary purpose of the compendium should be to serve as a reference to existing biosafety programmes/courses offerings. However, it may also be used as a tool and framework to assist training institutions in developing curricula for their biosafety courses/programmes;

(b) Records of the academic courses and programmes listed in the compendium should:

(i) Provide specific information regarding the content and expected outcomes of the courses/programmes. This would give users of the compendium a clear picture of the scope of the courses/programmes;

(ii) Indicate the components of the course/programme (including percentages of time or credits allocated for the theoretical course work, the practical work (e.g. research, internships, etc) and the dissertation, if any;

(iii) Indicate the total number of credits for the course/programme;

(iv) Specify the minimum entry requirements, including academic/professional background and any prerequisites;

(v) Indicate if the course/programme is offered independently or as part of a larger network;

(vi) Mention the sponsors of the course/programme and any other institutions involved in its organization, design and delivery;

(vii) Provide names and profiles of the course/programme faculty (trainers), including their areas of expertise; and

(viii) Provide sample profiles of the course/programme alumni, including their career history after completing the course/programme.

(c) The list of general topics/subject areas listed in section 7 of the common format for the compendium should be expanded and each topic be broken down into specific areas. The additional topics suggested include:

(i) Introduction to modern biotechnology;

(ii) Biosafety communication;

(iii) LMO detection;

(iv) Experimental designs and basic statistical analysis;

(v) Bioethics; and

(vi) Information management;

(d) The format of the compendium should be flexible enough to allow for the inclusion of additional information that is unique to a specific course/programme;

(e) The compendium should be kept up-to-date. The owners of the programmes/course offerings should be encouraged to update their records directly on a regular basis.

17. Other general comments and suggestions made include the following:

(a) There is a need to carry out training needs assessments at the national and regional level in order for academic institutions to design demand-driven academic programmes. Parties and other Governments should be invited to complete training needs assessment forms and return them to the Secretariat for analysis and transmission to relevant academic institutions;

(b) The programmes should allow students to choose courses that address their needs and allow them to develop their own knowledge base and do their own biosafety research. The programmes should also impart knowledge and skills needed for effective implementation of the Cartagena Protocol;

(c) The programmes should be adapted to local conditions and should focus on the priority topics that are locally relevant;

(d) Biosafety programmes should be multidisciplinary in nature, covering key scientific, regulatory (legal/policy), socio-economic and communications subjects;

(e) Wherever possible, the programmes should incorporate a research component, including scientific, legal/policy, socio-economic or bioethics research. Research-based programmes should further contribute to knowledge development in the area of biosafety and generate baseline data and information for scholarly and/or regulatory purposes; and

(f) Universities and other training institutions should collaborate in order to deliver high quality programmes in a more cost-effective manner.

18. Following the initial general discussion, two focus discussion groups were established to review and revise, as appropriate, the common format for the compendium and the training needs matrix respectively. The revised format for the Compendium and the matrix are contained in annexes I and II below.

19. It was recommended that the Secretariat should further develop the training needs assessment matrix and send it to all Governments to be filled and returned to the Secretariat before the next meeting of the Conference of the Parties serving as the meeting of the Parties to the Protocol.

B. Consideration of COP-MOP decisions relating to biosafety education and training

20. Under agenda item 3.2, participants discussed how COP-MOP decisions relating to biosafety education and training could be implemented. The general observations, comments and suggestions made include the following:

(a) There is a need to develop and/or expand long-term biosafety education and training programmes, either as stand-alone biosafety degree/diploma programmes or as components of other relevant degree/diploma programmes. It was noted that while short-term *ad hoc* course offerings and workshops help to promote general understanding and appreciation of the issues, they are not sufficient to train the cadre of biosafety professionals and specialists required for the effective implementation of the Protocol;

(b) A central resource centre (either virtual or physical) should be established where institutions can access and exchange information, including guidelines and other resource materials, that can assist them in the design and delivery of biosafety academic programmes/courses;

(c) An online bulletin board should also be established in the Biosafety Clearing-House (BCH) to facilitate the exchange of information by institutions and the advertisement of short-term needs for faculty/experts in specific subjects as part of their biosafety courses/programmes;

(d) It is important for academic institutions to liaise and collaborate closely with the relevant national authorities, particularly the National Focal Points for the Cartagena Protocol in order to adapt existing and/or develop new programmes that address national capacity needs in biosafety and take into account the decisions of COP-MOP and the GEF Strategy for Financing Biosafety Activities. Through such collaboration, governments could also provide seed funding and other resources for the development of biosafety academic programmes in the relevant academic institutions;

(e) Relevant regional bodies, networks and initiatives, such as the New Partnership for Africa's Development (NEPAD) African Biosciences Initiative 2/, should be utilized during the process of developing and implementing academic programmes in biosafety;

(f) Emphasis should be placed on locally-developed biosafety academic programmes that utilise local experts and resources. Such programmes are more likely to be sustainable;

(g) Effort should be made to institutionalize externally-funded training programmes at relevant academic institutions in order to ensure their sustainability and local ownership. Many such programmes, especially those funded as part of larger projects, have often end as soon as the project funds run out;

(h) Regional and institutional cooperation is vital to the development of cost-effective biosafety academic programmes;

(i) In view of the scarcity of biosafety experts/faculty and a lack of facilities and equipment for biosafety training and research in most countries emphasis should be put on developing and/or expanding existing academic programmes at regional and sub-regional levels in order to maximize use of resources;

(j) It is important that Governments make biosafety a priority policy issue and provide funding to universities and other relevant institutions to develop and/or expand academic programmes that focus on training biosafety professionals.

2/ The NEPAD African Biosciences Initiative consists of four regional networks of centres of excellence developed to support African countries to strengthen human capacity in biosciences and to develop and apply bioscience technologies that can address Africa's problems in agriculture, health, and environment. See further details at: http://www.nepadst.org/doclibrary/pdfs/biosciences_busplan_sep2005.pdf

C. Exchange of information on existing biosafety education and training programmes and collaborative initiatives

21. Thirty three (33) short presentations were made by participants at the meeting. In addition, six detailed presentations were made by UNIDO, UNESCO, RIBios, BiosafeTrain, GenØk and PBS. The following are some of the general observations that emerged from the presentations:

(a) Currently most of the institutions do not have fully-fledged degree or diploma programmes in biosafety. A few of them have developed course units on biosafety as components of other undergraduate and postgraduate degree programmes in areas such as agronomy, environmental studies, biotechnology, etc.

(b) As part of their continuing education programmes, some academic institutions are offering *ad hoc* short-term training seminars, workshops and intensive courses of varying durations ranging from a few days to a few weeks. Most of these programmes are limited in scope and provide a general introduction to biosafety-related topics.

(c) Long-term education programmes in biosafety are essential to producing the comprehensive multidisciplinary expertise necessary for the effective implementation of the Cartagena Protocol. It is important for such programmes to be flexible enough to respond to regional requirements and to offer training curricula and delivery methods that are tailored to the needs of the target audience.

(d) A number of existing programmes are project-driven and externally funded. Some of them are not yet formally institutionalised within the academic system of their respective university departments.

(e) A few universities have established regional and international collaborative initiatives which, *inter alia*, involve: development of joint curricula, MSc. and PhD fellowships, staff exchanges, joint student instruction and supervision, improvement of training and research infrastructure, etc.

(f) Some of the key factors highlighted as limiting the development of biosafety academic programmes include:

(i) A shortage of qualified local experts/trainers;

(ii) Limited access to training materials and up-to-date information on biosafety and biotechnology developments;

(iii) A lack laboratory equipment and facilities for biosafety field research and training;

(iv) A lack of sustainable sources of funding; and

(v) Uncertainty about the long-term demand for biosafety graduates;

(g) To date, there has been limited effort in identifying which universities and other institutions are offering biosafety education and training as stand-alone programmes or as part of other academic programmes. The review done so far is largely based on the information voluntarily registered in the compendium of academically-accredited biosafety courses accessible through the Biosafety Clearing-House. There is a need to undertake more comprehensive stocktaking surveys in different regions. Building upon its recent "Assessment of Ongoing Efforts to Build Capacity for Biotechnology and Biosafety", the United Nations University Institute of Advanced Studies (UNU-IAS) should be

invited to undertake such surveys in collaboration with the CBD Secretariat and make the information available through the Biosafety Clearing-House.

22. The following are some of the main experiences and lessons that emerged from the case-study presentations:

(a) Distance education (or e-learning) is an effective delivery mechanism for biosafety academic programmes. It is cost-effective, reaches out to wider audiences and is flexible and easier to tailor to the students' needs. It also allows students to pursue their studies according to their own convenient timeframe without disrupting their ongoing professional obligations.

(b) Successful distance education (e-learning) requires considerable student involvement, self-motivation and commitment. It also requires availability of adequate and efficient communications infrastructure.

(c) Careful screening of applicants is required to determine the appropriateness of the e-learning method for them so as to minimise the drop-out rate.

(d) Some of the main challenges of distance education include: Internet limitations (in terms of access, speed and cost), logistical challenges (e.g. different time zones, language barriers, lack of access to online journals, etc) and difficulties in supervising the students' work from a distance and providing follow-up field support.

(e) Academic accreditation for the programmes is essential.

(f) It is important to take a long-term view in the design and implementation of biosafety academic programmes.

(g) It is also important to identify or develop sustainable sources of funding for biosafety academic programmes to cover the costs of curriculum development, staff time, student support, infrastructure and logistical arrangements.

(h) Pooling of resources through a collaborative network arrangement increases cost-effectiveness in the design and delivery of the programme and in the development of course materials.

(i) As demonstrated by the UNESCO University Twinning and Networking (UNITWIN) Programm, inter-university collaboration can play a big role in facilitating the transfer of knowledge and technology, in developing and/or strengthening academic programmes and in facilitating staff development through exchange visits and fellowships. 3/

(j) Most of the existing resource materials on biosafety (including scientific papers, journal articles, training manuals and other resource materials) are in English. There is a general shortage of biosafety literature in other languages. Materials need to be translated into the languages of instruction.

(k) There are few biosafety experts/instructors in most developing countries and some of the existing experts have not been identified. It is important to develop and maintain a database of lecturers/resource persons at the regional and international level.

3/ See details about the UNESCO/UNITWIN programme at: http://portal.unesco.org/education/en/ev.php-URL_ID=22129&URL_DO=DO_TOPIC&URL_SECTION=201.html.

D. Key considerations in the development of academic programmes in biosafety: guiding principles, strategies and mechanisms

1. Nature of the programmes and level of accreditation

23. Decision BS-III/11, paragraph 16, of the Conference of the Parties serving as the meeting of the Parties to the Protocol encourages Parties and other Governments to invite universities and colleges to develop and/or expand degree-granting programmes that focus on training biosafety professionals. Participants in the meeting recommended that:

(a) Priority should be given to the following types of academic programmes:

(i) Master of science progammes with an emphasis on research as well as PhD programmes;

(ii) Diploma programmes by course work, lasting 12-18 months; ;4/

(iii) Continuing education certificate programmes: short term target-specific courses which may also grant academic credits.

(b) Biosafety courses should also be integrated, as appropriate, in existing undergraduate and postgraduate programmes, for example biological, environmental and biotechnology programmes as core and/or elective modules. In some cases, this might be an easier and more feasible strategy than starting new stand-alone biosafety programmes. This could also help to diversify employment opportunities for graduates trained in biosafety;

(c) The different categories of programmes referred to in paragraph (a) above should be maintained to cater to a wide range of target groups and country needs. Short-term course offerings could cater for professionals with Masters or PhDs (and other qualifications) in relevant fields who wish to acquire additional specialised knowledge and skills in biosafety but are not interested in pursuing another full Masters or PhD programme. Continuing education programmes in biosafety would also cater to the needs of specific target groups such as the media, farmers and other stakeholders.

2. Target groups

24. The immediate target group for the programmes should be individuals who are dealing with biosafety regulatory and research issues, including: policy makers, regulators, technical advisors, risk assessors, customs and quarantine officials, monitoring and enforcement officials, scientists, researchers and academics.

25. For the degree and diploma programmes in biosafety, it is desirable for candidates to have previous academic background in relevant fields, e.g. agronomy, genetic engineering, biology and other life sciences, social sciences, law and others. Minimum prerequisites should be clearly defined for admission to specialised fields of biosafety (e.g. LMO detection). Pre-qualifying courses may also be organised for candidates lacking the minimum entry requirements.

4/ It was noted that there are differences in definitions and interpretations of what constitutes a postgraduate degree/ diploma program under different country or regional accrediting systems. In some countries, the term “diploma” is not recognised as an academic credential.

3. Core curriculum elements and programme design

26. Stand-alone biosafety programmes and short-term course offerings should have core elements adhering to the main topics identified in the capacity-building Action Plan, taking into specific account country/regional needs and the requirements of the awarding university. In order to provide students with a minimum base of knowledge, compulsory core elements of the curriculum should include, but not limited to, the following modules:

(a) Introduction to biosafety;

(b) Introduction to modern biotechnology as it relates to biosafety;

(c) Risk assessment;

(d) Risk management;

(e) LMO detection/ identification;

(f) Regulatory systems; and

(g) Biosafety communication (public awareness and education in the context of Article 23 of the Protocol).

27. The stand-alone biosafety degree programmes should provide for electives (optional courses) to enable students develop specialized expertise in particular fields in accordance with their individual needs and professional interests/aspirations. The elective courses should be developed in a modular format.

28. The programmes should have a clear structure and well articulated learning objectives and expected outcomes that can easily be evaluated. These should be reviewed and fine-tuned by curriculum development groups.

29. The programmes should indicate the minimum number of credits that a student must complete in order to obtain the degree or diploma.

30. The programmes should be demand-driven and should take into account the country/regional needs. They should also be flexible enough and adaptable to cater to the varying needs of a wide range of target groups with different backgrounds. The one-size-fits-all approach is not feasible.

4. Delivery mechanisms

31. In addition to conventional programme delivery methods (i.e. full time residential/ on-campus instruction), the following methods should be considered:

(a) Distance education or e-learning (using internet-based tools, CD-ROMs, audio-visual conferencing and mail); and

(b) A combination of distance learning and residential/on-campus instruction (i.e. hybrid programmes).

32. Distance education programmes should include on-campus sessions with a component of practical training. On-campus sessions facilitate face-to-face interactions and network-building.

33. Modular courses should be developed to provide flexibility for students who are unable to attend a traditional semester format due to their work schedules.

5. Quality control criteria and mechanisms

34. Quality control is vital to ensuring the credibility and relevance of a programme. It can be achieved through a number of strategies and mechanisms including, *inter alia,* the following:

(a) Peer-review of the course content and resource materials by eminent experts in the different areas of biosafety;

(b) On-going evaluation of the programme content and delivery methods, *inter alia*, through feedback from students as well as external evaluations;

(c) Rigorous student performance assessment before academic credentials are awarded;

(d) Adherence to internationally recognized standards (e.g. License-Master-Doctorate, European Credit Transfer System and others).

35. The responsibility for quality assurance should lie with the academic institution awarding the credentials.

6. Sustainability of the programmes

36. The long-term sustainability of the programmes should be considered right from the conception and design stage. It is important to ensure continuing fiscal and logistical support for the programmes, the availability of faculty/trainers and the continued provision of appropriate academic support services, including library resources.

37. Resources and experts should be pooled and shared for example through regional or sub regional inter-university collaborative networks. This is a useful strategy for ensuring the sustainability of the programmes particularly in developing countries. The pooling of resources, the exchange of staff and the joint development of teaching materials can increase the cost-effectiveness of the programmes.

38. The sustainability of biosafety academic programmes could also be enhanced through a training-of-trainers approach whereby some of the graduates from the programmes are retained and used to train new candidates.

39. Government funding is essential for ensuring the sustainability of biosafety academic programmes due to the relatively limited demand for such programmes. The COP-MOP should invite Parties, other Governments, bilateral and multi-lateral agencies and the Global Environment Facility to provide financial support for the development of biosafety academic programmes.

40. Furthermore, due to the market demand uncertainty (i.e. job placement opportunities) for biosafety graduates it may not be feasible to develop biosafety academic programmes in each country. In some instances, it would be advisable to develop such programmes at the sub-regional level at selected universities or centres of excellence.

E. Regional and international activities, processes and mechanisms to facilitate the development and delivery of academic programmes in biosafety

41. Participants highlighted the need to establish and/or strengthen existing regional and sub-regional networks among universities and other institutions to facilitate the development and/or expansion of biosafety academic programmes. They also noted the need for relevant universities or other training institutions in different sub-regions or regions to agree among themselves on a network node (hub) or facilitating university/institution. It was recommended that initial emphasis should be placed on building upon existing networks.

42. Networks should be allowed to emerge naturally based on country/regional needs, institutional interests and capacities. In this regard, a bottom-up approach process should be adopted.

43. The establishment of networks and the designation of the network nodes or facilitating universities/institutions should be formalized, for example through memoranda of understanding (MoUs). This would lend credibility to the facilitating university/institution and the network as a whole. It would also foster buy-in by relevant institutions. The MoUs should specify the roles and responsibilities of the different network members.

44. The criteria for selecting the network nodes/ facilitating universities/institutions must be agreed upon by all the participating universities and institutions in the region or subregion. It is recommended that national focal points for the Cartagena Protocol and the Biosafety Clearing-House focal points are invited to participate in that process.

45. The network node or facilitating university/institution should, *inter alia*:

(a) Be independent

(b) Be regionally recognised;

(c) Have the support and trust of the network members;

(d) Have the necessary institutional and technical capacity and staff;

(e) Have considerable experience and strong leadership on biosafety issues;

(f) Have close links with academia in the region/sub-region;

(g) Be a degree-awarding institution or have direct affiliation with degree awarding institutions;

(h) Have, or be able to access, multidisciplinary expertise; and

(i) Be supportive of the Cartagena Protocol on Biosafety.

46. The roles and responsibilities of the network node/ facilitating university/institution should, *inter alia*, include the following:

(a) Act as a facilitator to promote interactions and dialogue among universities and other network members the development and/or expansion of biosafety academic programmes;

(b) Coordinate the network activities;

(c) Foster and facilitate exchange of experiences and best practices among network members;

(d) Mobilise funding for the development and delivery of the programme, either through local budgeting or by fundraising from external sources;

(e) Facilitate expert/faculty and student exchanges;

(f) Facilitate the sharing of information and resources, including educational materials; and

(g) Spearhead the curricula development process, taking into account regional and individual country needs and input from network members, and

(h) Perform other functions as may be deemed necessary by the network members.

47. Consultative meetings should be organised regularly for the participating institutions and relevant stakeholders, including donors, to discuss, *inter alia*:

(a) Criteria for curriculum development (including determination of the programme content), taking into account regional and country needs;

(b) Guidelines for quality control (including a programme peer-review process and the setting of accreditation standards);

(c) Guidelines for programme delivery (including the admission procedures, programme schedule, methods of instruction and assessment, etc); and

(d) Modalities for sharing faculty, academic materials and other resources, as well as systems for transfer of credits by students between participating institutions.

48. Ultimately the responsibility for curriculum development, programme delivery and quality assurance should lie with the designated nodal institutions awarding the academic credentials.

49. Participants agreed that international activities, processes and mechanisms for facilitating the development and delivery of academic programmes in biosafety should be discussed at a later stage after relevant experience has been gained at the regional and subregional levels. In the meantime, inter-regional collaboration and the sharing of experiences should be encouraged.

50. It was recommended that inter-linkages should be established between the different activities/ processes under the Coordination Mechanism, including meetings of the Liaison Group on Capacity-Building in Biosafety, the coordination meetings for governments and organizations implementing or funding biosafety capacity-building activities and the coordination meetings of academic institutions. This could be achieved through organizing the meetings back-to-back and/or exchanging each other's reports.

IV. THE WAY FORWARD

51. Participants from the different regional groupings (i.e. Africa, Asia and the Pacific, Central and Eastern Europe, Latin America and the Caribbean, and Western Europe and Others (WEOG)) discussed and agreed on the follow-up activities in their respective regions.

A. African region

52. The African group agreed to initiate a process of establishing a regional network of universities and centres of excellence involved in biosafety education and training. In the interim, the African Union Commission (AUC), in collaboration with NEPAD, was requested to facilitate and provide institutional support for the proposed network until a decision is taken by members of the network. The University of Dar-es-Salaam was selected as the interim convener of the network.

53. It was agreed that, in the future, it would be useful to establish sub-networks for each of the five subregions designated by the African Union, i.e. North Africa, West Africa, Central Africa, Eastern Africa and Southern Africa.

54. The group agreed to undertake the following activities:

(a) Establish an electronic discussion forum for members comprised of the participants present at this meeting and others who will be invited to sign up later;

(b) Collect and collate information on existing biosafety education and training activities and biosafety trainers in the region and make it available through the AUC database and the compendium in the BCH;

(c) Develop and submit to the AUC a project proposal to carry out a regional training needs assessment in the field of biosafety;

(d) Develop a project concept for promoting the development of new biosafety academic programmes in Africa and strengthening of existing ones;

(e) Organize, in collaboration with the AUC and the Convention Secretariat, a regional meeting of universities and centres of excellence which are involved in biosafety education and training to, *inter alia*:

(i) Formalize the establishment of the network and discuss its operational modalities;

(ii) Review the collated information and the training needs assessment report;

(iii) Consider and further develop the project concept; and

(iv) Discuss other relevant issues.

B. Asia and the Pacific region

55. In view of the vast geographic coverage and the large population of the Asia Pacific region, it was agreed that regional/sub-regional networking was an indispensable strategy for fostering sustainable and efficient implementation of biosafety academic programmes.

56. Five sub-regional networks are envisaged for South East Asia, South Asia, East Asia, West Asia and for the Forum of Pacific Island countries including New Zealand and Australia. Those sub-regional

networks should feed into a central regional network and/or directly into the global Coordination Mechanism under the Protocol through the Biosafety Clearing-House.

57. The proposed terms of reference for the networks include the following:

(a) To develop profiles and databases for existing biosafety academic programmes and modules, developed curriculum and awarding institutions in the region.

(b) To facilitate efficient and sustainable distribution of information to all countries;

(c) To develop country and subregion-specific modules based on the compiled material and feedback from network members in order to avoid "reinventing the wheel";

(d) To promote buy-in from member countries on a real needs basis based on in-country experience;

(e) To provide translation facilities to address the problem of language diversity in the member countries as well as the problem of limited access to information;

(f) To ensure that the programmes are sustainable.

58. The networks should take advantage of existing regional groupings and agencies which have institutional structures, services and resources that can facilitate the development and delivery of biosafety academic programmes. These include:

(a) Regional economic integration bodies such as the Association of Southeast Asian Nations (ASEAN), South Asian Association for Regional Cooperation (SAARC), Pacific Islands Forum Secretariat, etc;

(b) University groupings (Asian University conference, ASEAN University Network, 5/ Pacific forum university groups, etc) and research networks, e.g. the Consultative Group on International Agricultural Research (CGIAR) centres, Southeast Regional Center for Graduate Study and Research in Agriculture (SEARCA), 6/ etc;

(c) Regional development agencies, e.g. the Asian Development Bank, Inter-American Development Bank (IDB)), Organization of Islamic Conference Standing Committee on Scientific and Technological Cooperation (OIC-COMSTECH)) and donor agencies; and

(d) International non-governmental organizations, e.g. the International Service for the Acquisition of Agri-biotech Applications (ISAAA), World Conservation Union (IUCN), World Wide Fund for Nature (WWF), etc.

C. Central and Eastern Europe (CEE) region

59. Participants from the CEE region agreed to work as a task force to initiate contacts within the region in order to organise, in cooperation with CBD Secretariat, a regional meeting of relevant institutions. One possibility is to consider convening the meeting back-to-back with the Black Sea Biotechnology Association meeting which will take place in autumn 2007. The interim task force will be

5/ http://www.aseansec.org/Feature-AUN.htm

6/ http://web.searca.org/page.asp?id=16&cat=About%20Us

comprised of the four participants from the region who attended this meeting. It is hoped that the Regional Steering Committee will be formed at the regional meeting expected to take place in autumn.

60. Participants also agreed to explore the possibility of establishing sub-networks for sub-regions such as the Black Sea region, West Balkans, Balkans, Caucasus and Central Asia.

61. Relevant regional and international partners working in the region will be invited to participate in and support the process. These may include: the International Centre for Genetic Engineering and Biotechnology (ICGEB), IFPRI Program for Biosafety Systems (PBS), RIBios, the Universities of Ancona, Ghent and Tromso, and the partners on the European Commission 7th Research Framework Programme (FP7) FP7 Black Sea cooperation.

D. Latin America and the Caribbean (GRULAC) Region

62. It was noted that the GRULAC region has a number of ongoing biosafety training activities under different projects and initiatives at the national and regional level. Examples include: UNEP-GEF projects, the World Bank-GEF projects, ICGEB courses, UNIDO-sponsored e-Biosafety diploma programmes, the GENØK regional courses, GMO-ERA project, FAO projects and others. However, there is no mechanism for facilitating interaction and mutual collaboration between the different training initiatives. Furthermore, there is no mechanism for gathering and collating information on the status of biosafety training in the region and making it available to countries.

63. Participants agreed on the need to identify sub-regional focal points to coordinate the collection and dissemination of information on biosafety educational activities in the following subregions:

(a) Andean Community of Nations (CAN);

(b) Central America;

(c) The Southern Common Market (MERCOSUR); and

(d) The Caribbean.

64. It was also agreed that a regional meeting should be organized to discuss the region's priority needs with regard to biosafety education and training and strategies and initiatives to address those needs. The Convention Secretariat was requested to assist with the identification of potential donors to provide funding for the meeting. Participants from the region who attended the meeting were asked to explore the possibility of securing funding for the meeting and the regional initiative to promote biosafety education and other capacity-building programmes.

E. Western Europe and Others Group (WEOG)

65. Participants from the Western Europe and Others Group (WEOG) noted that currently there are very few biosafety academic programmes being offered in western universities. Furthermore, there is limited collaboration among academic institutions in the area of biosafety.

66. It was recommended that a message be sent to relevant universities and institutions regarding the need to collaborate in order to develop biosafety academic programmes. As a first step, a survey of relevant institutions and faculty involved in biosafety education should be undertaken to determine who is doing what and a database be created. For universities and other institutions within the European Union, this could be done through the European Commission. Furthermore, it was recommended that regional activities be promoted to discuss the initiatives to be taken at the European Union level for the

improvement of biosafety education and training in the EU academic system and for the establishment of regional and sub-regional steering groups.

V. GENERAL RECOMMENDATIONS

67. In addition to the above-mentioned follow-up activities at the regional level, a number of other general recommendations were made regarding key strategic actions that should be undertaken as a follow-up to the meeting. These are summarized below:

68. It was recommended that the Secretariat:

(a) Makes the report of the meeting available to all national focal points (NFPs) for the Cartagena Protocol.

(b) Sends a notification to all National Focal Points inviting them to initiate discussions with relevant authorities in their countries (such as Ministries of Education), in order to help facilitate the development and/or expansion of biosafety degree/diploma-granting programmes at the national and regional level, taking into account the proceedings of this meeting.

(c) Liaises closely with relevant institutions in each region and assist them, as appropriate, to implement recommendations of this meeting and to organize follow-up regional consultative meetings to discuss modalities of strengthening existing and/or establishing new regional and sub-regional networks.

(d) Expands the Biosafety Information Resource Centre in the Biosafety Clearing-House to facilitate the sharing of information and data from ongoing and completed research in biosafety.

(e) Explores the possibility of organising a meeting to discuss the role of, and strategies for promoting, biosafety research.

(f) Organizes, in collaboration with interested partners, a side event at COP-MOP 4 to disseminate the results of this meeting and get feedback from Parties, other Governments and relevant organizations.

69. It was also recommended that universities and other institutions involved in biosafety education and training:

(a) Establish and/or join existing regional and sub-regional networks to facilitate the development and/or expansion of academic programmes that focus on training biosafety professionals.

(b) Embark on the collection and collation of information on existing relevant programmes and key stakeholders/partners. The information collected should be shared through the BCH.

(c) Organize follow-up regional consultative meetings to discuss options for developing and/or expanding biosafety academic programmes as well as institutional arrangements for fostering collaboration and networking.

(d) Take cognizance of the observations and suggestions outlined in this report in the development and delivery of biosafety academic programmes, including the proposed core curriculum elements, the delivery mechanisms, etc.

(e) Liaise closely with the national focal points for the Cartagena Protocol and other relevant national authorities in order to develop and/or expand biosafety academic programmes that address national/regional needs and solicit government funding.

70. Furthermore, it was recommended that Conference of the Parties serving as the meeting of the Parties to the Protocol invites Parties and other Governments to:

(a) Complete and return to the Secretariat the biosafety training needs assessment matrix and before the fourth meeting of the Conference of the Parties serving as the meeting of the Parties to the Protocol;

(b) Work closely with relevant academic institutions in order to enable them to enhance and/or develop appropriate biosafety programmes;

(c) Provide funding and other support to relevant universities and institutions in their countries or regions for the development and delivery of biosafety academic programmes; and

(d) Initiate actions within Government system to enhance/commence biosafety education and training programmes.

71. Finally, it was recommended that Conference of the Parties serving as the meeting of the Parties to the Protocol:

(a) Invites developed country Parties and other Governments, bilateral and multi-lateral agencies and the Global Environment Facility to provide financial support for the development and/or expansion of academic programmes that focus on training biosafety professionals;

(b) Provides further guidance to facilitate the development and/or enhancement of longer-term academic programmes that focus on training biosafety professionals, taking into account the outcomes of this meeting.

Annex I

COMMON FORMAT FOR THE COMPENDIUM

1. TITLE OF THE COURSE/PROGRAMME:

2. TYPE OF COURSE/PROGRAMME:

Part of a degree programme	☐	Stand-alone offering	☐
Part of a Research Initiative	☐	Continuing education	☐

3. VENUE:

Institution:

City:

4. COUNTRY:

5. Region

6. YOUR COURSE/PROGRAMME URL:

7. Other institutions that contribute to the initiative as organizers:

8. Supporting Organiations:
(*Indicate if there is more than one)*

9. LANGUAGE USED: (indicate proportions if several)

English	☐	Arabic	☐	Other	☐
French	☐	Russian	☐	*Please specify:*	
Spanish	☐	Chinese	☐		

10. BRIEF DESCRIPTION OF YOUR COURSE/PROGRAMME (max. 100 words):

11. TOPICS COVERED BY YOUR COURSE/PROGRAMME: (please specify the amount of time in hours)

Topic/Subject	Hours	Topic/Subject	Hours
Environmental, food and feed safety ☐		Compliance and enforcement ☐	
Regulatory regimes (laws/regulations) ☐		Data & information management ☐	
Systems for handling applications ☐		Liability and redress ☐	
Risk assessment and risk management ☐		Socio-economic considerations ☐	
Monitoring for potential impacts ☐		Other ☐	
Public awareness and participation ☐		Cross cutting issues, specify	
Introduction to modern biotechnology			

Replace/ compare/ include in list with the list from the Capacity Building Action Plan – this provides the opportunity to use an adopted list.

12. TARGET AUDIENCE:
(Indicate specifically each one on the list)

Scholars
Undergraduate students ☐
Graduate students ☐
Government officials (policymakers, administrators, regulators, inspectors, etc.) ☐
Technical personnel who prepare or review applications (public & private sector) ☐
Working professionals/specialists (natural and life science scientists, lawyers, social scientists, bioethicists, economists, etc.) ☐
Farmers ☐
Public interest groups (consumer groups, professional associations, NGOs, etc.) ☐
Mass media and outreach/extension workers ☐
General public, politicians, etc ☐

12. FORMAT:

Modular format ☐
Non-modular/ course format ☐
Workshop format ☐

Additional Comments:

13. TYPE OF TRAINING:

Workshop

Seminar

Conference

More that 40 hrs Course/Programme

More than 160 hours course/ Programme

Residency course/programme ☐

Distance learning (Online) ☐

Combination of residency and distance learning ☐

Laboratory based

Field work

14. DURATION:

Less than 40 hrs activity (theory/practical)

More than 40 hrs activity (theory/practical)

More than 160 hrs activity (theory/practical)

Total number of contact hours:

Duration of the entire course/ programme:

Number of credits

15. ADMISSION REQUIREMENTS (e.g. level of knowledge & experience required~~, age limit,~~ etc):

Other eligibility criteria

16. MAXIMUM NUMBER OF PARTICIPANTS:

17. APPLICATION PROCEDURE:

DEADLINE FOR APPLICATION

18. TYPE OF CERTIFICATION/ACCREDICATION and INTERNATIONAL RECOGNITION (for instance, what type/kind of certification or degree or other qualification is issued at the end of the course/programme):

- Postgraduate degree ☐
- Postgraduate diploma ☐
- Postgraduate certificate ☐
- Bachelor's degree ☐
- Diploma ☐
- Certificate ☐

Certificate of attendance ☐

None ☐

Other (*please specify*) ☐

Title of programme if part of degree:

19. EVALUATION

Is this first time the course/programme is offered?
Is this a recurring course/programme? If yes, for how long?
Outcomes of the course/ programme (follow-up programmes, etc.)
Has the course/ programme been developed on the basis of a needs assessment?
Has the course been independently evaluated? If so, please provide a link to, or attach the evaluation report(s)?

20. COURSE/PROGRAMME FEES (in US$):

21. SCHOLARSHIPS AVAILABLE FOR DEVELOPING COUNTRIES PARTICIPANTS:

Yes ☐ No ☐

22. ANY OTHER RELEVANT INFORMATION:

e.g. Faculty/institutional profile

23. CONTACT PERSON FOR ADDITIONAL INFORMATION

☐ Mrs. ☐ Mr.

Last name First name

Organization

Street Number

Postcode City

Phone Fax

E-mail

Date:

Annex II

BIOSAFETY TRAINING NEEDS MATRIX

TRAINING NEEDS (KEY COMPETENCES – KNOWLEDGE AND SKILLS REQUIRED)	MAJOR TARGET GROUPS														
	Decision/policy-makers (e.g. Ministers)	Government regulators/ (administrators handling applications)	Technical personnel/ advisors, experts who review the applications)	Enforcement officials (e.g. field inspectors)	Customs officials	Specialists (e.g. lawyers, scientists, economists, etc	IT, BCH and data/ information managers	Researchers & technicians (e.g. in field trials or in the laboratories)	Graduate & undergraduate students	Interest groups (consumer groups, farmers, NGOs)	Mass media/ extension workers	Politicians	General public	Other
Introduction to Biosafety and modern biotechnology														
Risk assessment														
Risk management														
Regulatory framework														
Biosafety communication														
LMO detection/identification														
Post release monitoring														
Field trial monitoring														
Biosafety research														
Precautionary principle														
Administrative practices (including handling of requests for LMO imports/exports and other types of applications such as releases)														
Audit of risk assessment														
Preparation and presentation of LMO export or release applications/dossiers														

TRAINING NEEDS (KEY COMPETENCES – KNOWLEDGE AND SKILLS REQUIRED)	MAJOR TARGET GROUPS														
	Decision/policy-makers (e.g. Ministers)	Government regulators/ (administrators handling applications)	Technical personnel/ advisors, experts who review the applications)	Enforcement officials (e.g. field inspectors)	Customs officials	Specialists (e.g. lawyers, scientists, economists, etc	IT, BCH and data/ information managers	Researchers & technicians (e.g. in field trials or in the laboratories)	Graduate & undergraduate students	Interest groups (consumer groups, farmers, NGOs)	Mass media/ extension workers	Politicians	General public	Other
Drafting/ knowledge of biosafety laws & regulations														
Drafting/use of technical manuals & guidelines														
Biosafety law enforcement techniques/procedures														
Decision-making practices														
Socio-economic considerations														
Cost/benefit analysis as part of the risk management strategy														
Public awareness and participation														
Data and information management, including use of the BCH														
Molecular characterization														
Procedures to be applied to LMO transboundary movements (including information on neighboring countries)														
Documentation requirements for LMO shipments														
Traceability procedures and techniques (e.g. labeling)														

TRAINING NEEDS (KEY COMPETENCES – KNOWLEDGE AND SKILLS REQUIRED)	MAJOR TARGET GROUPS														
	Decision/policy-makers (e.g. Ministers)	Government regulators/ (administrators handling applications)	Technical personnel/ advisors, experts who review the applications)	Enforcement officials (e.g. field inspectors)	Customs officials	Specialists (e.g. lawyers, scientists, economists, etc	IT, BCH and data/ information managers	Researchers & technicians (e.g. in field trials or in the laboratories)	Graduate & undergraduate students	Interest groups (consumer groups, farmers, NGOs)	Mass media/ extension workers	Politicians	General public	Other
Safety requirements and procedures for LMOs contained use														
Safety requirements and procedures for LMOs releases														
Compliance requirements under the CPB														
Liability and redress requirements														
Understanding of other International agreements relevant to biosafety														

Annex III

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