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THIRD INTERNATIONAL MEETING OF ACADEMIC INSTITUTIONS AND ORGANIZATIONS INVOLVED IN BIOSAFETY EDUCATION AND TRAINING
Tsukuba, Japan, 15-17 February 2010

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

I. INTRODUCTION

1. The third International Meeting of Academic Institutions and Organizations Involved in Biosafety Education and Training was held from 15 to 17 February 2010, at Tsukuba in Japan. It was attended by a total of 44 participants from 23 countries and four international organizations.

2. The countries represented were: Belgium, Chile, China, Côte d'Ivoire, Croatia, Cuba, Germany, Indonesia, Iran, Japan, Kenya, Malaysia, Mali, Mexico, Norway, Peru, Philippines, Serbia, Slovenia, South Africa, Sri Lanka, Thailand and the United Republic of Tanzania. The organizations represented were: United Nations Educational Scientific and Cultural Organization (UNESCO), United Nations University Institute of Advanced Studies (UNU-IAS), Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) and the Center for Society, Technology, and Medicine of the College of Medicine National Cheng Kung University. The full list of participants is contained in Annex III to this report.

3. The meeting was organized by the Secretariat of the Convention on Biological Diversity and the Government of Japan through the University of Tsukuba in collaboration with the Institute of Advanced Studies of the United Nations University (UNU-IAS). Funding for participants from developing countries and countries with economies in transition was provided by the Ministry of Environment of Japan, Japan Society for Promotion of Science and the University of Tsukuba. Other sponsors were: Ministry of Education, Culture, Sports, Science and Technology (MEXT) via the Project for Establishing Core Universities for Internationalization (Global 30), the Environmental Diplomatic Leader Program with Special Coordination Funds for Promoting Science and Technology of Japan Science and Technology Agency, and Plant Transgenic Design within University of Tsukuba and the Ministry of Foreign Affairs of the Government of Japan.

4. The objectives of the meeting were to:

(a) Exchange information and experiences on existing biosafety education and training programmes and initiatives;

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(b) Review the progress made in implementing recommendations of the previous two meetings of academic institutions and organizations involved in biosafety education and training;

(c) Propose strategies and mechanisms to improve biosafety education and training programmes in order to meet the needs of Parties to the Protocol, including the possibility of developing model biosafety education programmes tailored to the needs of different regions;

(d) Explore options for facilitating ongoing collaboration and exchange of information, training materials, curricula and faculty members between academic institutions and organizations offering biosafety education and training programmes.

II. MEETING PROCEEDINGS

OPENING OF THE MEETING

5. The meeting was opened by Ambassador Kiyoshi Araki from the Ministry of Foreign Affairs of Japan. Opening remarks were also made by Dr. Kazuko Shiojiri, Vice President of University of Tsukuba and Mr. Charles Gbedemah on behalf of the Executive Secretary of the Convention on Biological Diversity.

6. In his opening statement, Ambassador Araki welcomed the participants to Japan and underscored the importance of the meeting. He noted that biosafety education and training are major pillars for building capacities for the effective implementation of the Cartagena Protocol on Biosafety. He reported that Japan has made significant contributions to biosafety capacity-building efforts including through its financial contributions to the Global Environment Facility and through dispatching experts overseas. He observed that the co-organization of this meeting was part of Japan's continued support to such efforts. Ambassador Araki informed participants that Japan will host the tenth meeting of the Conference of the Parties to the Convention on Biological Diversity (COP 10) and the fifth meeting of the Parties to the Protocol in Nagoya, Aichi Prefecture in October 2010. He expressed hope that the two meetings will produce fruitful outcomes including the adoption of a Supplemental Protocol on Liability and Redress in the context of Cartagena Protocol, finalization of the International Regime on Access and Benefit-Sharing and adoption of the post-2010 biodiversity targets.

7. In her remarks, Dr. Shiojiri expressed her gratitude to the CBD Secretariat for having given the University of Tsukuba the opportunity to host the meeting. She informed participants that University of Tsukuba with its motto of "coexistence with the world as an international center of knowledge" has developed many global relationships with universities, institutes, organizations, as well as industry and business companies. She reported that the university has more than 1,700 international students from 104 countries, the second largest number of international students at a national university in Japan. She informed participants that in the preceding year, the Ministry of Education and Sciences selected University of Tsukuba as one of the 13 core universities that would receive and educate international students under an ambitious initiative known as, "Project for Establishing Core Universities for Internationalization - (Global 30)". The project aims at sponsoring and training 300,000 international students in Japan by 2020. Dr. Shiojiri further reported that the Environmental Diplomatic Leader (EDL) program of the university is one of the distinguished examples of the international collaboration on sustainable management of biological resources. The programme has established a new innovative educational training center at the University which aims at producing "environmental diplomatic leaders.

8. Speaking on behalf of Dr. Ahmed Djoghlaf, the Executive Secretary of the Convention on Biological Diversity, Mr. Gbedemah thanked the Government of Japan for sponsoring and hosting the meeting. He underscored the urgent need for promoting biosafety education and training, noting that

effective implementation is still constrained by the limited capacity of the Parties, especially the lack of technical human resources. He urged participants to come up with concrete recommendations that would contribute to addressing this challenge by fostering the development and improvement of academic programmes in biosafety.

ORGANIZATIONAL MATTERS

9. After the opening session, the participants elected Prof. Kazuo Watanabe (Japan) and Prof. Amanda Galvez (Mexico) to serve as Co-Chairs of the meeting and Prof. Chris Viljeon (South Africa) to serve as Rapporteur.

10. The meeting then adopted the following agenda on the basis of the provisional agenda (UNEP/CBD/BS/ CM-ET/3/1), which was developed by the Secretariat in consultation with the Organizing Committee of the Government of Japan:

1. Opening of the meeting.
2. Organizational matters:
   - 2.1. Election of officers;
   - 2.2. Adoption of the agenda;
   - 2.3. Organization of work.
3. Exchange of information and experiences on existing biosafety education programmes
4. Progress on implementation of the recommendations made by previous international meetings of academic institutions and organizations involved in biosafety education and training.
5. Strategies and mechanisms to improve biosafety education and training.
6. Collaboration and exchange of information among academic institutions and organizations involved in biosafety education and training.
7. Other matters
8. Conclusions and recommendations.
9. Closure of the meeting.

11. The participants also adopted the organization of work for the meeting, as contained in annex I to this report.

ITEM 3. EXCHANGE OF INFORMATION AND EXPERIENCES ON EXISTING BIOSAFETY EDUCATION PROGRAMMES

12. Under this item, participants made short presentations on the status of their biosafety education programmes and training activities and shared their experiences and lessons learned with emphasis on the developments since the last meeting held in 2007 in Kuala Lumpur, Malaysia. A number of participants submitted written reports which were compiled and distributed on CD-ROM. It was agreed that the presentations will also be made available through the Biosafety Clearing-House. From the presentations the following key points were noted:

(a) In most countries training in biosafety is still predominantly through non-academic (non-accredited) short-term courses, workshops and conferences. These are carried out primarily to build awareness and general appreciation of biosafety issues among the various stakeholders and to assist specific target groups (including regulators, policy-makers, scientific and technical staff) acquire basic knowledge and skills in the performance of their duties. While short term non-formal training activities have contributed to capacity-building in biosafety, there are concerns regarding: (1) their long term sustainability; (2) the uneven quality, balance and objectivity of their course content; and (3) the credentials of trainers/experts offering them.

(b) A few institutions, such as GenØk – Centre for Biosafety and the International Centre for Genetic Engineering and Biotechnology (ICGEB), are offering short-term non-accredited courses in biosafety on a regular basis.

(c) There are very few standalone degree and diploma-granting programmes in biosafety currently offered around the world. This is largely due to the limited funding available for biosafety in general and the uncertainty about the long-term demand (job opportunities) for biosafety graduates to merit offering stand alone degree programmes in biosafety. Examples of standalone programmes include the Master in biosafety programme which will be offered by the University of Malaya in the 2010/2011 academic year. This will be a follow-up to the previous post-Graduate Diploma in Biosafety that was developed as part of the UNIDO e-biosafety training network.

(d) A number of Universities are offering biosafety courses as part of other accredited degree programmes such as Botany, Ecology, Entomology, Molecular Biology, Biotechnology, among others. It was noted that these courses allow graduates to have better flexibility in career path considering the uncertainty of the long-term demand and employment options for biosafety trained graduates. Universities offering biosafety courses as part of other programmes include: Kenyatta University in Kenya, National Agrarian University in Peru, National Autonomous University of Mexico, Peradeniya University in Sri Lanka, University of Abobo-Adjamé in Côte d'Ivoire, University of Dar-Es-Salaam, University of the Free State in South Africa, University of Ljubljana in Slovenia, University of the Philippines Los Baños and University of Tsukuba in Japan.

(e) Currently, biosafety education is mostly offered at the postgraduate level. This includes dedicated graduate (PhD and MSc) research on specific areas such as risk assessment and risk management, LMO detection and legal aspects. A few universities, such as Moi University in Kenya, are offering biosafety courses at the undergraduate level.

(f) Many biosafety training programmes in developing countries have been made possible through collaborative initiatives between local universities and universities/institutions in developed countries. Examples include: the collaborative training in biosafety between Genøk and various institutions in Africa, Asia and Latin America; University of Bamako-RIBios collaborative training initiative in West Africa, the BiosafeTrain project involving Danish and East African Universities and research institutions; and the UNIDO e-biosafety training network.

(g) A few regional and South-South collaborative initiatives on biosafety education and training have been implemented and others are proposed. For example, the Higher Institute of Applied Technologies and Sciences in Cuba has developed a joint biosafety academic programme with the National University of El Rosario and Universidad Juan Agustin Maza in Argentina through which they will exchange academic staff and training materials. The University of Malaya is also planning to have a multi-campus Asian cooperative biosafety academic programme which will involve academic staff exchange and transfer of credits.

(h) The sustainability of academic collaborative initiatives has been one of the biggest challenges. It was reported that some of the initiatives, such as the University of Bamako-RIBios initiative, wound up after the donor funds ran out. Others, such as the UNIDO e-Biosafety training programmes at University of Concepcion in Chile and Ghent University in Belgium have been scaled down. The participants emphasised the need for factoring into such collaborative initiatives, resource generation strategies to ensure their sustainability when donor funding ends.

13. Other key challenges include:

(a) Shortage of qualified and experienced trainers/staff in different aspects of biosafety (including regulatory and technical/scientific aspects) and the high turnover of staff.

(b) Limited funds to support biosafety education and training activities, including procurement of training materials, field research and support to students, e.g. to attend the on-campus training sessions.

(c) Limited availability of biosafety teaching material (including real-life dossiers and full risk assessment reports) and key publications to support the courses.

(d) Lack of infrastructure for practical training.

(e) Lack of sufficient technical and scientific background by some students to effectively participate in some of biosafety training programmes. For example, students sometimes lack basic knowledge in subjects such as plant molecular biology to be able to understand risk assessment and risk management or to effectively participate in practical GMO detection sessions.

(f) Lack of political will to support biosafety education and training. Most of the existing programmes are project-oriented with no long-term funding support.

14. The following are some of specific experiences and lessons learned that were highlighted by participants regarding the organization and delivery of biosafety education and training courses and programmes:

(a) Commitment on part of the students to actively participate in the online sessions and to follow through with all the training modules on time, a necessary component of E-learning.

(b) Usefulness of developing standardized training modules covering basic knowledge, issues and practices relating to different biosafety topics to ensure consistency in the content and quality of the programmes. In this regard, the University of Malaya, in collaboration with the Ministry of Higher Education, is in the process of developing standardized teaching modules in biosafety which will be offered as part of relevant academic programmes in various public and private institutions of higher learning in Malaysia.

(c) The need for the development of specific course materials on biosafety to facilitate effective transfer of knowledge and skills is crucial. In this regard, Minzu University of China has developed a textbook on “Biosafety and Regulation of Genetically Modified Organisms” which has been recommended by Science Press as a key textbook on biosafety education to all universities in China. The University of Malaya, the Higher Institute of Applied Technologies and Sciences in Cuba and the National Autonomous University of Mexico have also developed such training materials.

(d) Usefulness of developing structures to facilitate continued communication, coordination and networking among students and resource persons that participate in biosafety education and training programmes. Establishing an "alumni network" is one effective way of promoting such interaction among participants and building social and pedagogical support after the training courses. A network established by the GenØk – Centre for Biosafety has proved very useful.

(e) Development of a balanced curriculum that addresses not only the scientific and technical aspects of biosafety but also the regulatory and socio-economic aspects.

(f) The need to put in place strategies to ensure the sustainability of courses/programmes.

15. With regard to the organization of short-term courses, the following experiences and lessons learned were highlighted:

(a) The importance of planning the courses as early as possible since administrative and logistics issues can affect timeliness.

(b) The need for clear organizational and decision making structures. The tasks and responsibilities in organizing the courses must be clearly divided among the partners involved and the final decision maker in case of disagreements must be designated.

(c) The need for an effective structure of the various components of the courses to ensure good interrelationship and balance (e.g. between plenary and laboratory practical sessions, where appropriate).

(d) The need to circulate the course materials (including the programme and background documents) to participants prior to the commencement of the course.

(e) The importance of using examples and case studies from within the country or region where the course is taking place to illustrate relevant points.

(f) The need to carefully plan and tailor the courses to specific target audiences. It is important to ensure that the right level of technical and information detail is provided to the participants.

(g) The importance of hands-on practical training and the need to ensure, when conducting group practical sessions, that all members in a group participate in the laboratory work, and that the "scientist" or experienced participants do not dominate, but instead act as resource persons to help the non-experienced participants.

(h) The importance of conducting clear and well planned post-course evaluations which help define goals and desired outcomes before the next course takes place.

16. The following general points were also highlighted during the meeting:

(a) General introductory workshops and short courses on biosafety offered over the past few years were considered outmoded. There is a need for in-depth academic training and education linked to areas of professional and practical application.

(b) Building capacity in biosafety must be considered as a long-term activity in which a critical mass of individuals and institutions acquire capabilities across a range of functions.

(c) More innovative, varied, yet targeted approaches are required in the design and delivery of biosafety training and capacity building programmes, including and emphasis on learning-by-doing and iterative approaches.

(d) Regional initiatives and networks were considered more effective if they focus on information exchange and facilitating South-South cooperation.

(e) It is important that academic institutions identify the gaps in their biosafety education and training programmes, taking into account the needs and demands of students, regulators, industry and other stakeholders and the career opportunities of students after the training.

17. Overall, the participants welcomed the experiences shared. They expressed the need to support universities or other educational institutions in their efforts to establish and provide high quality education and training in the area of biosafety. It was noted that in the light of rapid development of biotechnology, education and training in biosafety is imperative and must be tailored to keep pace with new trends.

ITEM 4. PROGRESS ON IMPLEMENTATION OF THE RECOMMENDATIONS MADE BY PREVIOUS INTERNATIONAL MEETINGS OF ACADEMIC INSTITUTIONS AND ORGANIZATIONS INVOLVED IN BIOSAFETY EDUCATION AND TRAINING

18. Under this agenda item, representatives from four regional groupings namely Africa (Dr. Flora Ismail), Asia and the Pacific (Dr. Rofina Yasmin Othman), Central and Eastern Europe (Dr. Aleksej Tarasjev) and Latin America and the Caribbean (Dr. Antonietta Gutiérrez-Rosati) presented short reports on the progress made with regard to the implementation of the recommendations of the last meeting in their respective regions. Representatives of the United Nations University - Institute of Advanced Studies (UNU-IAS), Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) also made presentations on their current regional and global activities related to biosafety education and training.

19. Dr. Ismail reported that the African region made limited progress in implementing the activities that were recommended at the second meeting due to a number of factors. For example, it was not possible to organise the regional meeting of universities and centres of excellence involved in biosafety education and training due to lack of funding. It was also reported that although an electronic discussion forum was established participation was very limited. Nevertheless, a number of biosafety education and training initiatives, including short courses, were implemented. For example with support from the BiosafeTrain project (www.biosafetrain.dk), short-term biosafety courses were organised in Tanzania (July 2007), Kenya (November 2007); Uganda (October 2009) by the University of Dar-Es-Salaam, University of Nairobi and Makerere University respectively, in collaboration with other institutions including the International Centre for Genetic Engineering and Biotechnology (ICGEB) and the GMO-ERA Project. Several MSc and PhD students were also trained in various biosafety areas. A few universities in the region are offering biosafety courses as part of other academic programmes. These include: the University of Dar-Es-Salaam in Tanzania, University of Nairobi and Kenyatta and Moi universities in Kenya, Makerere University in Uganda, University of the Free State in South Africa, University Cheik Anta Diop (UCAD) in Senegal, University of Bamako in Mali and the University of Abobo-Adjamé in Côte d'Ivoire. In addition, various institutions, including: the Interdisciplinary Biosafety Network (RIBios), GenØk-Centre for Biosafety, USAID-funded Program for Biosafety Systems (PBS), NEPAD/ABNE (African Biosafety Network of Expertise), the World Bank-GEF biosafety project in West Africa and the GMO Laboratory Network for the Southern African Development Community

(SADC) have also supported a number of short-term non-academic biosafety courses in collaboration with local universities.

20. In the Asian region, a number of follow-up activities to the recommendations of the second meeting of academic institutions were carried out. A "Workshop on Biosafety Education in Asia" was held at the University of Tsukuba in Japan from 31 October to 1 November 2007. At that workshop, the participants established the Asian Biosafety Education Network (ABEN), through which they agreed to cooperate to support human resource development, education and research in biosafety, focussing on the needs for education on the policy, legal, ethical, economic and social implications associated with modern biotechnology applications. Through the ABEN, institutions involved in biosafety education and training plan to develop accreditation criteria for certifying biosafety professionals in the region. It was noted that countries in the region have developed biosafety laws which might require certified experts to perform certain tasks. Efforts are underway to mobilise more members to join the ABEN. The network has already started catalyzing collaboration between various institutions. For example, the University of Malaya is collaborating with Universities in Thailand. As well, memoranda of understanding have been developed to facilitate exchange students between different universities. A number of universities in the region are offering biosafety courses as part of other academic programmes or as non-academic short courses for practitioners. These include: University of Malaya in Malaysia, University of Tsukuba in Japan, University of Peradeniya in Sri Lanka, University of the Philippines Los Baños, Kasetsart University in Thailand, Yangzhou University and Minzu University of China, National Cheng Kung University, University of Zanjan and the Agricultural University of Mazandaran in Iran.

21. In the Central and Eastern Europe region most of the proposed follow-up activities, including the regional meeting of relevant institutions, were not implemented due to lack of funding. Currently there is no institution in the region offering an academic degree or diploma in biosafety. Very few universities in the region, including University of Ljubljana in Slovenia and the University of Belgrade in Serbia, are offering biosafety courses as part of other academic programmes or as non-academic short courses. Few short-term ad-hoc training activities and collaborative partnerships have also been implemented by organizations, such as the FAO-supported hands-on training workshop on GMO detection held in Osijek, Croatia in 2008 and the workshop on risk assessment and risk management held in Prague in 2008. The European Commission also supported a few training courses in the region, including the training course on GMO detection, identification and quantification held in March 2008 in Sofia, Bulgaria.

22. In Latin America and the Caribbean, very few universities and institutions have started formal biosafety educational programs. Biosafety education is mostly offered as a part of the curricula for other degree programmes for biologists, agronomist or other related professions. This is happening, for example, in Mexico, Brazil, Colombia, Peru, Argentina and Chile. In Cuba, the Institute of Applied Technologies and Sciences offers a Master degree in biosafety and also short courses and individual training. In Chile, the University of Concepción in collaboration with UNIDO is offering a diploma in biosafety. Short-term training courses for regulators and technical personnel have also been also been developed in some countries. In Brazil, AnBio runs biosafety training activities for professionals and also for school students. The National Autonomous University of Mexico has also offered tailored short-term biosafety courses and has developed specific training modules and materials/manual on LMO detection in Spanish. Dr. Gutiérrez-Rosati reported that no region-wide network for institutions involved in biosafety education and training has yet been established to facilitate exchange information and experiences. There is a need for support to establish such a network and/or sub-regional networks. She noted that the use of different national languages (Spanish, English and Portuguese) in the region has often made it difficult to organise joint training, share training materials and exchange experts.

23. The United Nations University - Institute of Advanced Studies (UNU-IAS) has undertaken a number of activities in support of biosafety education and training. In 2008, it published a report entitled, "Internationally Funded Training in Biotechnology and Biosafety – Is it Bridging the Biotech Divide?",

which presents findings of a two-year assessment study. The assessment revealed that capacity levels remain insufficient in most developing countries and noted the need for more targeted and in-depth capacity building, the need to understand capacity building as an iterative and long-term endeavour, the differing capacity needs of diverse stakeholders and the promise and challenges of regional approaches to capacity building. The UNU-IAS is also preparing other research reports, including reports on: (a) "Analysis of risk assessment methodologies" (to be published) and (b) "Risk communication, Sustainable commercialization and governance of Biotech in Asian developing countries- case of Biotech Papaya, Philippines" (to be published) and "Rethinking capacity building: a brief comparative analysis in ABS and biosafety". With regard to education, the UNU-IAS collaborated in the development of a course on International Regulation on Biotechnology at University of Melbourne (2007). It has also facilitated the design and development of course modules for Masters program on various aspects of biosafety in selected universities in Asia, in collaboration with Tsukuba University, and is considering supporting the establishment of a Network of Biosafety Educators that would encourage exchange of information and scholars in the area of biosafety.

24. The Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA), which was established in 1966 by the Southeast Asian Ministers of Education Organization (SEAMEO), has supported a number of activities related to education and training in biosafety and biotechnology. The Centre seeks to build human resource capacities of Southeast Asian institutions working toward agricultural and rural development through graduate scholarship, training, research and development, and knowledge management. It has provided scholarships to graduate students from SEAMEO countries to pursue masters and doctoral degrees in agriculture and related sciences. This has allowed the creation of a pool of experts in fields such as molecular biology, biotechnology, entomology and agronomy which are related to biosafety. Other SEARCA initiatives geared towards human resource development include the Professorial Chairs Program, Visiting Scientist Program, the Academic Bridging Program and the Southeast Asian University Consortium (UC) for Graduate Education and Natural Resources. The Consortium, which links 9 universities top agricultural universities in the sub-region facilitates free exchange of information, facilities, and expertise. Activities of the Consortium include: (i) student exchange programme which allows students to cross-enrol and take courses or conduct their research in any of the Consortium member universities and transfer course credit units to their host university; (ii) faculty exchange which enables faculty members visit other UC members and teach courses, advise students and share first-hand experience with their counterparts on academic and research activities in their fields of expertise; and (iii) research fellowships for faculty or research staff of UC members to conduct collaborative research projects in SEARCA's priority areas, which include: sustainable natural resource management, food and agriculture policy, biotechnology in agriculture and bioinformatics. Another SEARCA initiative relevant to biosafety is the Biotechnology Information Center, which was established, in collaboration with the International Service for the Acquisition of Agri-biotech Applications (ISAAA), to serve as the hub of the regional network for science-based information on agricultural biotechnology. The Center also organises training workshops on biotechnology, food safety and environmental safety, including risk assessment and risk management.

25. The representative of UNESCO, Ms. Rovani Sigamoney, described her organization's mandate and programmes relevant to biosafety education and training, noting that UNESCO assists governments to catalyze and promote regional and international action, develop relevant policies, build capacity, promote sustainable development through science to attain the Millennium Development Goals (MDGs). She reported that UNESCO's International Basic Sciences Programme (IBSP) is working towards: strengthening national capacities for basic research and training; promoting the sharing and transfer of scientific information and knowledge through training and North-South and South-South co-operation; improving science education and public awareness of science; science and technology capacity building through networking; and science policy advice. She also reported that UNESCO's biotechnology programme provides catalytic support to international centres, national institutions and UNESCO Chairs

in life sciences and biotechnologies to: (a) enhance scientific, technical and human capacity-building in the biosciences and biotechnologies at the graduate and post-graduate levels; (b) increase accessibility to novel and applicable science for human progress; (c) transfer knowledge in the biological sciences and biotechnologies; and (d) strengthen network activities and advocate best practices. Ms. Sigamoney also noted that UNESCO's "Ethics of Science and Technology" programme promotes the consideration of science and technology within an ethical framework through Standard-setting (including codes of conduct), capacity-building and awareness-raising. She also described UNESCO's Chairs programme and the University Education Twinning and Networking Scheme (UNITWIN). She noted that UNESCO Chairs serve as "think-tanks" and "bridge-builders" between the academic world, civil society, local communities, research and policy-making. To date there are more than 200 Chairs in Natural Sciences and 10 in Biotechnology. She described how the Chairs are established, including the procedure for submitting a proposal to established a Chair, and how they function.

ITEM 5. STRATEGIES AND MECHANISMS TO IMPROVE BIOSAFETY EDUCATION AND TRAINING

26. Under this item, participants discussed possible strategies and mechanisms for promoting and improving the development and delivery of academic biosafety education and training programmes. The discussions focussed on the content of the programmes and considerations regarding their format, organization and delivery.

A. Core curriculum elements

27. During the plenary session, the participants brainstormed on the core curriculum elements that academic institutions may wish to consider in designing their biosafety courses and programmes. A list of topics which was proposed by participants is presented in Annex II to this report. A small group was established to review the list and propose a shorter list of core elements. The following elements were proposed and adopted by the plenary session:

(a) Conservation and sustainable use of biological diversity

(b) Socio-economic considerations

(c) The Cartagena Protocol on Biosafety and other relevant legal instruments

(d) Risk assessment and risk management

(e) Introduction to modern biotechnology, current status and emerging and convergent technologies.

28. The Secretariat was requested to take into account the above elements when updating the common format for the Compendium of Academically-Accredited Biosafety Courses and Programmes in the Biosafety Clearing-House.

B. Design and delivery of biosafety courses and programmes

29. Three discussion groups were established to develop guidance that may be considered by relevant institutions to improve the design and delivery of three categories of academic biosafety courses and programmes, namely:

(a) Short-term biosafety courses and programmes

(b) Short-term specialised certificate courses

(c) Formal degree and diploma programmes

30. It was emphasised that the guidance was intended to provide suggestions for consideration in developing or re-designing and offering biosafety courses and programmes, based on the experience of institutions that have organised similar programmes, and not to be in anyway prescriptive. Each discussion group was asked to consider the following aspects:

(a) Duration of the courses/programmes

(b) Size of the classes

(c) Form of certification

(d) Formal evaluation and assessment of students

(e) Quality control, including external moderation and internal

(f) Minimum requirements for admission

(g) Sustainability of the courses/programmes

(h) Types of training material necessary

(i) Requirement for practical sessions.

31. The reports from the three groups which were presented and revised during the plenary are presented in Annex III to the report.

ITEM 6. COLLABORATION AND EXCHANGE OF INFORMATION AMONG ACADEMIC INSTITUTIONS AND ORGANIZATIONS INVOLVED IN BIOSAFETY EDUCATION AND TRAINING

32. Under this agenda item, participants had a brainstorming session and developed a list of action points to promote networking and collaboration among academic institutions involved in biosafety education programmes, at the global, regional or subregional levels. As a result, an activity plan specifying actions to be carried out as well as the timeframe and responsible persons was developed and is presented in Annex V.

ITEM 7. OTHER MATTERS

33. The participants expressed the need to hold another international meeting of academic institutions and organizations involved in biosafety education and training after the fifth meeting of the Conference of the Parties serving as the meeting of the Parties to the Protocol. The agenda for the meeting will be developed by the Secretariat taking into account issues that will emerge from the online discussions to be conducted through the portal for biosafety education and training on the Biosafety Clearing-House. Countries and institutions interested in hosting and co-organizing the meeting were invited to express their interest to the Secretariat.

ITEM 8. CONCLUSIONS AND RECOMMENDATIONS

34. The participants emphasised the need to promote a pedagogical approach to biosafety education and training. It was stressed that effective implementation of the Protocol requires well-trained biosafety professionals and certified experts to undertake various tasks. It was also reiterated that the current biosafety education and training efforts in different countries clearly need to be reviewed and

strengthened. In order to achieve this, academic and other relevant institutions, especially those in developing countries and countries with economies in transition, require additional financial and technical resources.

35. The participants adopted the following recommendations addressed to different stakeholders aimed at promoting and improving the development and delivery of academic biosafety education and training programmes:

Parties and other Governments

36. Request the fifth meeting of the Conference of the Parties serving as the meeting of Parties to the Protocol to invite Parties and other Governments to:

(a) Support existing and new national, subregional and regional biosafety education and training initiatives, including mobility support;

(b) Establish national and regional or sub-regional coordination mechanisms for education and training in biosafety;

(c) Commission country surveys/studies to establish baseline data on the current situation with regards to education and training related to biosafety;

(d) Make available to academic institutions relevant documentation (including real-life dossiers and full risk assessment reports), where available, for biosafety education and education purposes.

Academic institutions

37. Urge academic institutions to:

(a) Establish a global network on biosafety education and training and lobby for dedicated funds to facilitate communication and collaboration between relevant educational institutions;

(b) Reach out to national policy makers to make them aware of the importance of education and training in biosafety;

(c) Develop and share through the Biosafety Clearing-House lists of academics involved in training and education of biosafety;

(d) Ensure that their biosafety training and education programmes are accredited by the relevant accrediting bodies;

(e) Provide open source biosafety course material and teaching tools;

Secretariat

38. Request the Executive Secretary to:

(a) Create a portal for biosafety education and training on the Biosafety Clearing-House to make general and specialized information available, including existing funding support.

(b) Establish a sorting mechanism within the roster of experts to identify individuals involved in training and education in biosafety;

(c) Take into account the revised list of core curriculum elements when updating the common format for Academically-Accredited Biosafety Courses and Programmes in the Biosafety Clearing-House.

Other stakeholders

39. Invite the International Society for Biosafety Research (ISBR) to establish a component for biosafety education and training.

ITEM 9. ADOPTION OF THE REPORT AND CLOSURE OF THE MEETING

40. During the last session, participants reviewed and adopted the draft report of the meeting covering the proceedings of the previous two days. The Secretariat, in consultation with the co-chairs and the Rapporteur, was requested to incorporate proceedings of the last day and send the final draft report to all participants for comments before posting it on the website.

41. The meeting closed at 5.30 p.m. on 17 February 2010.

Annex I

ORGANIZATION OF WORK

15 February 2010 10 a.m. – 10.30 a.m.	*Agenda item*: 1. Opening of the meeting.
10.30 a.m. – 10.45 a.m.	*Agenda items*: 2. Organizational matters: 2.1. Election of officers; 2.2. Adoption of the agenda; 2.3. Organization of work.
10.45 a.m. – 11.15 a.m.	**Coffee/Tea Break**
11.15 a.m. – 1 p.m.	*Agenda items*: 3. Exchange of information and experiences on existing biosafety education programmes.
1 p.m. – 2 p.m.	**Lunch Break**
2 p.m. – 3.30 p.m.	Agenda item 3 (*continued*)
3.30 p.m. – 4 p.m.	**Coffee/Tea Break**
4 p.m. – 5.30 p.m.	*Agenda items*: 4. Progress on the implementation of the recommendations of previous international meetings of academic institutions and organizations involved in biosafety education and training.
16 February 2010 9 a.m. – 10.30 a.m.	*Agenda items*: 5. Strategies and mechanisms to improve biosafety education and training.
10.30 a.m. – 11 a.m.	**Coffee/Tea Break**
11 a.m. – 1 p.m.	Agenda item 5 *(continued)* Group discussions on item 5
1 p.m. – 2 p.m.	**Lunch Break**
2 p.m. – 3.30 p.m.	*Agenda items*: 6. Collaboration and exchange of information among academic institutions and organizations involved in biosafety education and training.
3.30 p.m. – 4 p.m.	**Coffee/Tea Break**
4 p.m. – 5.30 p.m.	Agenda item 6 *(continued)* Group discussions on item 6
17 February 2010 9 a.m. – 10.30 a.m.	*Agenda items*: Group presentations
10.30 a.m. – 11 a.m.	**Coffee/Tea Break**
11 a.m. – 1 p.m.	*Agenda items*:

	Consideration of group discussion reports
1 p.m. – 2 p.m.	**Lunch Break**
2 p.m. – 5 p.m.	*Agenda items*: 7. Other matters 8. Conclusions and recommendations 9. Closure of the meeting.

Annex II

List of Topics That May Be Considered for Inclusion in the Curriculum of Biosafety Education and Training Courses and Programmes

- Conservation and sustainability of biodiversity
- Liability and redress
- Socio-economics
- Risk benefit analysis
- Introduction to Biosafety Protocol
- Introduction to relevant international agreements
- Risk assessment:
    - Environmental risk assessment
    - Food and feed safety assessment
- Monitoring including post release
- Containment and confinement
- Biodiversity
- Current status of Biotechnology
- Emerging and convergent biotechnologies
- Science policy development
- Bioethics
- Relevant biological concepts
- National and regional regulatory systems
- Specific needs of the participants as prescribed in Art. 7 to 10 and 11
- Decision making procedures
- Traceability
- Labelling systems
- Regulatory systems
- Biosafety research methodology
- Public participation during decision making process.

Annex III

Reports of Discussion Groups on Guidance on the Development and Delivery of Academic Biosafety Courses and Programmes

GROUP 1 - Short term specialized training courses

Definition	More than half of the duration of the course should be focussed on one biosafety topic (e.g. risk assessment or LMO detection)
Duration	Minimum of 20 contact hours (need not be consecutive)
Class size	Not relevant
Form of recognition	Formal accreditation or certification by an academic institution
Evaluation	Formative assessment
Quality control	External moderation and student evaluation
Minimum requirements for admission	Based on content and institutional requirements
Sustainability	Up to institution offering the course and funding
Type of training material	Peer reviewed or other pedagogical resources
Requirement for practicals	Case specific

GROUP II: Short-Term Biosafety Training Courses

Definition	Comprehensive Biosafety Course accredited by a formal body or institute of higher learning of at least 40 hours
Duration	At least 40 theoretical contact hours with suggested additional practical hours
Size of cohort	Accreditor's minimum, Maximum 35 participants (e.g. formula - 10:1?)
Target group(s)	Undergraduate and graduate students, but can vary
Minimum requirements for admission	Bachelors or associate degree or equivalent experience
Form of Certification	Certificate with the Accreditor's name, general content, date, course hours duration, signature of the institutional authority, equivalent credit hours of the Accrediting University
External moderation & quality control	Accrediting Authority (e.g. University or Higher Education Ministry)
Sustainability	Funds, joining with partner institutes, consistent course faculty, administrative capacity. Integration into accreditors' system/University,

	MoUs. Cost recovery: Fee structure
Participant feedback	Strategic questionnaire
Assessment/evaluation of students	Research papers, case studies and exams Student attendance
Training material	Practical/case studies, plenary lectures, background documents, e-learning content. Requirement for development of a "course kit" including course materials and syllabus for the course
Other issues to consider	Frequency of course offering (related to sustainability)? Delivery methods (e-learning)? Intellectual property issues? Encourage waiving of intellectual property rights of biosafety course materials for public access

GROUP III: Formal Degree and Diploma programmes

A. Stand-alone programmes

Definition	Formal programme with a minimum of one year, including taught courses and dissertation or thesis to meet the country minimum credit hours for accreditation of a master programme. The programme should contain all the minimum core elements as defined in paragraph 27 of the report. Graduate/Postgraduate only. More possibility as regional or international programmes
Duration	Minimum of one year duration
Size of cohort	According to institution's minimum and mode of delivery
Target group(s)	Specialist "professional "programme", unsuitable for undergraduate
Minimum requirement for admission	Undergraduate or higher qualification or equivalent. Should not be limited to only science based undergraduates e.g. law, social sciences etc.
Form of certification	According to the National Accreditation Body requirements or Country equivalent - Masters in Biosafety - MSc (Biosafety) - Masters after Master (European system) - Masters after Bachelor
Mode of delivery	Programmes can be delivered in different modes. On-campus or e-learning with residential component recommended (mixed mode). Experience shows e-learning alone may not be sufficient especially for components like GMO testing and field trials and case study.
External moderation &	Faculty competency: Should have faculty that has experience or proof in

quality control	the subjects to be taught. To include international experts, if country doesn't not have full capacity? Training/retraining of experts
Sustainability	Ensure availability of funding for setting up formal programmes
Assessment/evaluation of students	Formal assessment In accordance with Institutional requirements. Quality control according to the national accreditation requirements.
Training material	Dedicated instructional materials on biosafety
Other issues to consider	Survival of existing of programmes. Need to set up regional-based programmes, e.g. UNIDO network. Requirement for practical work

B. Integrated programmes

Definition	Biosafety courses or modules as part of existing undergraduate or graduate programmes, e.g. minor or module
Duration	One semester (minimum 30 hours) with equivalent credits hours, for both undergraduate and graduate/postgraduate programmes
Size of cohort	According to institution's minimum and mode of delivery (e.g. distance learning)
Target group(s)	Undergraduate, graduate or postgraduate
Minimum requirement for admission	Undergraduate or higher qualification or equivalence. Should not be limited to science based undergraduates e.g. law, social sciences etc.
Form of certification	Bachelors, Masters or PhD, depending on the programme in which biosafety is integrated; Major or minor in biosafety
Mode of delivery	Programmes can be delivered in different modes. On-campus or e-learning with residential component recommended (mixed mode).
Quality control	External moderation
Assessment/evaluation of students	Formal assessment in accordance with the institution's requirements. Quality control according to national accreditation requirements.
Training material	"Course kits" including course materials on biosafety
Other issues to consider	Integrated modules should contain basic principles of all the core elements on biosafety identified in paragraph 29 of this report Requirement for practical work.

Annex IV

List of Action Points to Promote Networking and Collaboration among Academic Institutions to Promote Biosafety Education and Training

- Encourage governments to support initiatives in training and education of biosafety training though funding
- International funding agencies are encouraged to support biosafety training and education through global networks
- Suggestion for an international biosafety facilitation fund for exchange of experts, scholarships and Establish model for regional/subregional course
- Fund existing and new efforts in capacity building on biosafety funding
- Request countries and funding agencies to earmark funding for training and education in biosafety
- Funds from CBD to support initiatives in biosafety education and training at regional / subregional and cross regional level
- Request countries/donors to provide funding for mobility support for biosafety experts in training and education
- Encourage governments to consider establishing an action plan for supporting training and education in biosafety
- Need to facilitate communication between educational centres involved in biosafety training and education through a global network
- Countries are encouraged to support regional platforms
- National policy makers must be made aware of the importance of training and education in biosafety
- Establish a list of academics involved in training and education of biosafety
- Request to create a portal on the BCH for biosafety education to make general and specialized information available on the BCH on biosafety education and training including to funding support etc
- Encourage institutions already offering biosafety training and education to get these accredited
- Highlight a separate group in the roster of experts through sorting mechanism to identify individuals involved in training and education in biosafety
- Repository for open source course material and teaching tools for training and education in biosafety
- Create avenues for the upgrade of existing knowledge in faculty
- Countries are encourage to establish a coordination mechanism for training and education in biosafety
- Encourage parties and academic institutions to waive all IPR on training material in biosafety
- Standardize material for training and education in biosafety
- Course material should be made public so that others can benefit from existing training material
- Universities must be encouraged to collaborate on training and education in biosafety at a regional and subregional level
- Recommend to the Society for Biosafety to have a section for biosafety training and education

- Encouraging existing institution must play a more prominent role in training and education in biosafety
- Encourage bilateral cooperation in training and education on biosafety
- Request countries to promote national coordination in different programs for training and education in biosafety
- Encourage Biotech companies to provide open access to study cases of genetically modified organisms that will have academic value
- Countries are requested to establish baseline data on the current situation in training and education related to biosafety.

Annex V

Action Plan for Promoting Networking and Collaboration among Academic Institutions to Promote Biosafety Education and Training

GOVERNMENTS	How	Who	When
Encourage governments to support existing and new national, subregional and regional initiatives in biosafety training and education, including mobility support	Recommendation to COP-MOP, reiterating paragraph 9 of decision BS-IV/3.	Secretariat to include the recommendation in the pre-sessional document for MOP	
Encourage governments to establish a national coordination mechanism for training and education in biosafety	MOP Decision		
Countries are requested to establish baseline data on the current situation in training and education related to biosafety	MOP Decision		
Request academic institutions and academics to provide access to risk assessment documentation where available for biosafety training and education	Activity for the forum		
SECRETARIAT			
Create a portal / website on the BCH for biosafety education to make general and specialized information available on biosafety education and training including to funding support etc (move to academics)	CBD Secretariat to establish the portal on BCH and provide passwords to participants.	Aleksej Tarasjev (moderator for discussion forum) David Quist, Wendy Elliott & Sofia Valenzuela (Listings of educational resources, collaborative partners and programs, jobs, meetings)	March–June 2010 (Determine the content of the website) December 2010 (Implement the website)

Highlight a separate group in the roster of experts through sorting mechanism to identify individuals involved in training and education in biosafety (move to academics)	Activity for the forum – place finalized information on the website		
ACADEMIA			
Facilitate communication and collaboration between educational centres involved in biosafety training and education through a global network	Forum discussion		
Establish a global network on biosafety training and education and lobby for dedicated funds	Forum discussion		
Make National policy makers aware of the importance of training and education in biosafety	Forum discussion		
Establish a list of academics involved in training and education of biosafety			
Encourage institutions already offering biosafety training and education to get these accredited	Forum discussion		
Request academic institutions involved in biosafety training and education to provide open source course material and teaching tools	Forum discussion		
Recommend to the International Society for Biosafety Research (ISBR) to have a section for biosafety training and education	Send the recommendation to ISBR	Branka Javornik (Slovenia)	
