

BIO SAFETY



Newsletter



In this Issue

- Training Workshop on Environmental Risk Assessment of Genetically Engineered Plants
- Training Workshops on Risk Communication
- Training Workshops on Strengthening Capacities of Enforcement Agencies for Transboundary Movement of Living Modified Organisms (LMOs)
- Technical Training on Biosafety and Biosecurity Management of LMOs in Australia for Plant Quarantine Officers
- Community Radio Programs on Communicating Science and Biosafety
- Workshops on communicating science and biosafety for IIS probationers
- Meeting of the National Project Coordinators of UNEP/GEF Funded Capacity Building Projects in Dhaka, Bangladesh
- Consultative Meetings for the Third National Report on the Implementation of the Cartagena Protocol on Biosafety
- Ad Hoc Technical Expert Group on Synthetic Biology
- Online Discussions on Various Documents for Risk Assessment and Risk Management of Living Modified Organisms
- Biosafety Resource Kit for Genetically Engineered Plants
- Monitoring Confined Field Trials of Regulated Genetically Engineered Plants: A Manual and Tools for Trainers
- Taking Root : Global Trends in Agricultural Biotechnology
- The Global Pipeline of GM crops: an outlook for 2020
- Publications by OECD
- Upcoming events

From the Desk of Editor



I am pleased to share with the readers that the Phase II capacity building project on biosafety has been progressing remarkably, particularly the year 2015 was very eventful. Significant milestones have been achieved with completion of key activities in all the four thrust areas viz., risk assessment and risk management, handling, transport, packaging and identification of living modified organisms, socio-economic considerations and public awareness. This newsletter provides a glimpse of key achievements in last six months. Most notable are the trainings for a range of stakeholder's viz., scientists, regulators, communication personnel and enforcement agencies. Response to innovative outreach programs for farmers and students through community radios in different languages was very encouraging. Training workshops in environmental risk assessment of GE plants and risk communication were delivered by international experts through well-structured modules. Strengthening of enforcement capacities included a series of training workshops for customs and plant quarantine officials, hands on training on detection of LMOs in India and Sweden, and participation of plant quarantine officers in a technical workshop in University of Murdoch, Australia.

Recognizing the need for dissemination of state of the art and factual information to a wide range of stakeholders, a Biosafety Resource Kit has been prepared and released. The kit consisting of five brochures provides basic information on GE plants, confined field trials, regulatory framework in India, the Cartagena Protocol on Biosafety and useful information sources. A manual on monitoring of confined field trials to ensure regulatory compliance and a tools for trainers to assist those engaged in the monitoring of field trials have also been published. I am hopeful that these publications will facilitate outreach of information to the relevant stakeholders. I am also happy to inform that new project outputs are in the pipeline in the form of training programs, regional workshops, publications and outreach material during 2016.

I am pleased to inform that India has submitted its Third National Report on implementation of the Cartagena Protocol on Biosafety after a series of consultative meetings with relevant stakeholders. The report may be viewed at <http://bch.cbd.int/database/record.shtml?documentid=109211>

Hem Pande
Special Secretary
Ministry of Environment, Forest
and Climate Change

Training workshop on Environmental Risk Assessment of GE Plants

The Ministry of Environment, Forest and Climate Change (MoEF&CC) organized a "Training Workshop on Environmental Risk Assessment (ERA) of Genetically Engineered (GE) Plants", from September 15-17, 2015 at New Delhi as part of initiatives to strengthen the risk assessment and risk management of GE plants under the ongoing Phase-II Capacity Building Project on Biosafety. The training workshop was conducted by experts from Centre for Environmental Risk Assessment (CERA)-ILSI Research Foundation based in Washington. The objective of the workshop was to create



a pool of trained resource persons in the area of ERA of GE plants. The workshop was attended by 30 participants that included members of the regulatory committees viz. Review Committee on Genetic Manipulation (RCGM) and Genetic Engineering Appraisal Committee (GEAC) and scientists engaged in the development of GE plants in various Indian Council of Agriculture Research (ICAR) research institutions and SAUs. Members of the Expert Committee for formulating guidelines for ERA of GE crops as part of the ongoing Phase II Capacity Building Project on Biosafety also attended the training workshop.

Shri Hem Pande, Special Secretary, MoEF&CC and the National Project Director, Phase II Capacity Building Project on Biosafety chaired the opening session of the training workshop. Welcoming the participants, he informed the participants that MoEF&CC is developing a series of documents relevant to ERA i.e. Risk Analysis Framework for India, Guidelines for ERA of GE plants, User's Guide through an Expert Committee under the chairmanship of Prof C. R. Babu, Professor Emeritus, Centre for Environmental Management of Degraded Ecosystem, University of Delhi. Dr. Babu, in his remarks, appreciated the efforts being made by the MoEF&CC in strengthening the process of ERA of GE plants. He hoped that this training would be very useful in finalizing the various guidance documents under preparation.



Shri Hem Pande also released the "Biosafety Resource Kit for GE Plants" developed by MoEF&CC in association with Biotech Consortium India Limited, which provides comprehensive information on key issues on GE plants.

The faculty of the training workshop included Dr. Ranjini Warriar, Advisor, MoEF&CC and National Project Coordinator, Phase II Capacity Building Project on Biosafety, Dr Michael Wach, Senior Scientific Program Manager, CERA ILSI Research Foundation and Dr. Flerida Carino, Professor, Institute of Chemistry, University of Philippines. Dr. Ranjini Warriar introduced the draft ERA guidelines of GE plants to the participants and sought their suggestions / comments on the draft guidelines. The presentations were made by Dr. Wach and Dr. Carino on the following topics:

- Introduction to draft guidelines for environmental risk assessment of GE plants.
- Assessment of risk posed by GE plants
- Using Problem Formulation to structure the ERA process
- Pathway to harm
- Data quality and data transportability
- Special Topics in ERA: Evaluating Impacts to Non Target Organisms
- Special Topics in ERA: Evaluating Weediness and Invasiveness.
- Internet resources for ERA
- Communicating the risk assessment decision

The presentations were followed by group exercises conducted in groups consisting of 5-6 participants to enable in-depth understanding of concepts discussed by the faculty on the above topics.



Training Workshops on Risk Communication



Training workshop on Risk Communication from October 29-31, 2015 at Hyderabad in association with International Crops Research Institute for the Semi-Arid Tropics and from November 2-4, 2015 at MoEF&CC, New Delhi

Two training workshops on "Risk Communication", were organized by the Ministry of Environment, Forest and Climate Change (MoEF&CC) in association with international experts from Asia Bio Business (ABB) Pte Ltd, Singapore. The first workshop was held in association with International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) at Hyderabad from October 29-31, 2015 and the second workshop was held in MoEF&CC at New Delhi from November 2-4, 2015.

The three day workshops were aimed to train the participants for addressing and skillfully communicating queries related to risks perceived to be associated with genetically modified organisms (GMOs) and on biosafety. These training workshops brought together members from the regulatory committees viz., RCGM, GEAC; scientists from research institutions and state agriculture universities; communication specialists from Department of Biotechnology, Department of Science and Technology and the Department of Communication Research of Indian Institute of Mass Communication and journalists involved in communicating information about genetically engineering.

Dr. Kiran K. Sharma, Director, Platform for Translational Research on Transgenic Crops, ICRISAT, welcomed all the dignitaries and participants in the opening session of the workshop at Hyderabad. Dr Peter Carberry, Deputy Director General Research, ICRISAT informed that risk communication is an important area for enabling an environment for promoting biotechnology in India and appreciated the initiative taken by MoEF&CC in taking up this topic for the workshop. Shri Hem Pande, Special Secretary, MoEF&CC talking about the challenges faced while communicating about GMOs specifically with media and general public and stressed for capacity building of regulators and scientists in this area. Dr Ranjini Warriar, Advisor, MoEF&CC introduced "Information Dissemination for Public Awareness" as one of the thrust area under the phase II capacity building project on biosafety and hence several activities are being taken up to strengthen communication with stakeholders.

Dr S R Rao, Advsier, Department of Biotechnology, in his opening remarks at the workshop in Delhi indicated that the kind of information that needs to be communicated should be based on the needs of target stakeholders. He also emphasized that the information should be

communicated based on scientific facts and ease of understanding the language.

The trainings were conducted by the distinguished international experts viz., Prof. Paul Teng, Dr Andrew Roberts and Dr Andrew Powell, Risk Communication Specialists from ABB Pte Ltd, Singapore and gave presentation on the following topics:

- The Evolution of Risk Communication
- Risk Perception
- Deficit Model Failings
- Public and Organizational Trust
- Decision making under Risk and Uncertainty
- The Cultural Cognition of Science Consensus
- Practical steps in building a Risk Communication Strategy
- Developing message maps for information transfer and risk communication
- Message map presentation
- Message map interviews
- Effective delivery of messages : Public Meetings, Consultations and Hearings
- Counter measures and strategies to combat activism and aggressive NGOs in the context of Article 23

The format of the training workshops included presentations followed by group exercises developed with flipped classroom approach wherein participants were given topics for developing three key communication message maps. They were required to also develop supporting messages for the key message maps that would be specifically be targeted for specific stakeholder group(s). A live demonstration was given to participants by each group leader on the specific topics allotted to them as exercise, through video recording of their interviews. The flipped classroom approach of conducting exercises helped to reproduce short videos that were recorded during the trainings and can be used for further trainings in this area.



Training Workshop On

Strengthening Capacities of Enforcement Agencies for Transboundary Movement of LMOs



Training Workshop on Strengthening Capacities of Customs Officials for Transboundary Movement of LMOs at RTI, NACEN, Kolkata, West Bengal (Left); Training Workshop on Strengthening Capacities of Customs Officials for Transboundary Movement of LMOs at NACEN, Faridabad, Haryana (Right)

The National Bureau of Plant Genetic Resources (NBPGR) in association with the (MoEF&CC) organized a series of six training workshops on “Strengthening Capacities of Enforcement Agencies for the Transboundary movement of living modified organisms (LMOs)”, as part of the ongoing phase II capacity building project on biosafety. Four training workshops were targeted for custom officials and two trainings for the plant quarantine officials.

The two day training workshops for custom officials were organized jointly with the regional training institutes of the National Academy of Customs, Excise and Narcotics (NACEN) at Faridabad, Chennai, Mumbai and Kolkata in the months of October-November, 2015. The trainings

were attended by a total of 113 participants, which included Deputy Commissioners, Assistant Commissioners, Assistant Directors, Superintendents, Inspectors, Appraisers etc. from different parts of the country.

The two training workshops of three days each for the plant quarantine officials were organized in December, 2015 at NBPGR, New Delhi. A total of 24 participants including Plant Protection Officers, Assistant Plant Protection Officers and Scientific Assistants participated from the five Plant Quarantine Stations of Directorate of Plant Protection, Quarantine and Storage at New Delhi, Mumbai, Kolkata, Chennai and Amritsar in these trainings at New Delhi.

The faculty for the training workshops included eminent scientists, policy makers and members of regulatory authorities viz., NBPGR, Export Inspection Council, Punjab Biotechnology Incubator, MoEF & CC, Department of Biotechnology and Biotech Consortium India Ltd. Presentations were made on varied topics such as introduction to LMOs, National and International Regulations, Role of Customs officials, National Plant Quarantine System, Documentation requirements, GM crops/ events approved in different countries, Sampling procedures, Detection strategies and Use of Biosafety Clearing House.



Training Workshop on Strengthening Capacities of Enforcement Agency (Plant Quarantine Officials) for Transboundary Movement of LMOs on December 8-10, 2015 at ICAR-NBPGR, New Delhi



Technical Training on Biosafety & Biosecurity Management of LMOs for Plant Quarantine Officers in Australia



As part of the ongoing Phase II Capacity Building Project on Biosafety, a technical training program on “Biosafety and Biosecurity Management of LMOs” was organized for the Plant Quarantine Officials from September 28 to October 2, 2015 at the University of Murdoch, Australia. The program was aimed at strengthening the enforcement capacities for detection of living modified organisms (LMOs) and the biosecurity management systems in India as well as to facilitate better implementation of activities under the thrust area “Handling, Transport, Packaging and Identification (HTPI)” of the ongoing Phase II Capacity Building Project on Biosafety. The agenda for the technical program was designed specifically to facilitate exchange of information with regard to strategies for LMOs.

The core activities of the five day tour comprised of presentations, laboratory demonstrations and discussions on an array of topics including the Australian legislations, role and operations of the office of the Gene Technology Regulator (OGTR), Australian Biosecurity System, documentation requirements for transboundary movements of LMOs in context to country obligations under the Article 8, 10 & 18 (2) of the Cartagena Protocol on Biosafety (CPB). The Indian delegation visited the major grains export terminal at Kwinana for understanding the assessment of crop purity and cleanliness requirements for export and the Co-operative Bulk Handling Metro Grain Depot for understanding the delivery/receiving and segregation of GM and non GM grains. A field trip was also made to transgenic canola field wherein other agriculture practices and methods used for rapid detection of GM event at field sites was discussed.



Community Radio Programs on Communicating Science and Biosafety



The Indian Institute of Mass Communication (IIMC) organized a series of fourteen community radio programs on “Communicating Science and Biosafety”, as part of ongoing phase II capacity building project on biosafety.

IIMC organized these radio programs through collaboration with various state community radios such as Radio Jyotirgamaya (91.2MHz), Panjab University, Chandigarh; Radio Universal (106.8MHz), Universal College, Bangalore ; Radio Guruvani (90.8 MHz), Gujarat

University, Ahmedabad; JU (90.8 MHz), Jadavpur University, Kolkata; Azad Hind, Bhopal; Dnyanvani (90.4 MHz), D. Y. Patil University's, Navi Mumbai and IIMC's Apna Radio.

These programs were designed to induct stakeholders beyond the scope of the media workshops that were organized by IIMC earlier, to spread awareness on issues related to biosafety and Agri-biotechnology. These community radio programmes were aimed to create interest and enhance knowledge about biotechnology and biosafety through use of local languages. They also served as excellent platform for communication with farmers and listeners groups in small towns and rural villages. These programs were telecast in various regional languages like Gujarati, Marathi, Kannad, Bengali and Hindi.

The community radio programs included broadcast and production, public service announcements (PSAs), documentation and reporting. The various modes of formats in the radio programs ranged from live talk shows, interviews, quiz and panel discussions to audio drama on various topics such as role of communication for awareness of biosafety; about genetically modified crops, assessment of food derived by GM crops, biosafety in general etc. to name a few. Each programs had experts to disseminate information, views and opinions from various organizations across the country like Bose Institute, Kolkata; Department of Communication, Gujarat University; National Bureau of Plant Genetic Resources, New Delhi, Punjab Agricultural University and many more such eminent establishments.

WORKSHOPS ON COMMUNICATING SCIENCE AND BIOSAFETY FOR IIS PROBATIONERS



Round-up report presentation Certificate distribution to participants



Indian Institute of Mass Communication (IIMC), New Delhi organized two workshops on “Communicating Science and Biosafety” of Group A and Group B probationers/officers of Indian Information Service (IIS) on April 7-8, 2015 and June 5-6, 2015 at New Delhi under the ongoing Phase II Capacity Building Project on Biosafety.

The two workshops were aimed at introducing the concepts of biosafety in relation to genetically modified organisms (GMOs) and considerations about communicating such issues to general public. The participants from these workshops were nominated from the All India Radio (AIR), AIR-NSD, Doordarshan, DD NEWS, Press Information Bureau (PIB), Directorate of Advertising & Visual Publicity (DAVP), Directorate of Field Publicity (DFP), DPD, New Media Cell, SMC and a few Community Radio representatives from Apna Radio of IIMC.

Distinguished speakers from the Department of Biotechnology, Indian Agriculture Research Institute, Jawaharlal Nehru University, Biotech Consortium India Limited, SciDevNet and Digital Green delivered presentations and presented the following topics were:

- Innovations in biotechnology and importance of the biosafety programme
- Biosafety regulatory framework in India- Key feature of Cartagena Protocol on Biosafety
- Communicating Biotech: The Government Way
- Biosafety Clearing House and Information sources / databases on biosafety
- What makes Science report interesting and readable – Practice of Science Journalism in India
- Opportunities & Challenges in covering science – As a public broadcaster
- Safety assessment of GM crops in India and biosafety mechanisms
- Making a difference – Working with Digital Tools to communicate



A presentation was also delivered by a BBC correspondent from London highlighting the role of public broadcaster in communicating scientific issues and challenges/lessons learnt with handling GM related information in Britain.

Group work activities were also conducted on the second day of the workshops wherein participants were invited to make presentations on the topics related to biosafety which was followed by interactive question-answer sessions. The broad areas assigned for the group-work were:

- Innovations in Agri-biotechnology and implications for the region
- Agricultural Productivity, Self-reliance and Farmers issues in the Biosafety regime
- Food, Nutrition and Biosafety Issues for Consumers
- Socio-Economic aspects of Agri-biotechnology
- Environment, Biodiversity issues and Biosafety norms
- Dimensions of Regulation and Biosafety norms in the country and the region

19th Meeting of The National Project Coordinators of UNEP/GEF Funded Capacity Building Projects in Dhaka, Bangladesh



The nineteenth meeting of the National Project Coordinators (NPC) of UNEP/GEF supported Capacity Building Projects was held from September 21-23, 2015 in Dhaka, Bangladesh. The NPC meetings are held annually and are aimed to monitor the progress of the projects and enable sharing of experiences and challenges faced by participating countries.

The NPC meeting commenced with a welcome from Mohammed Solaiman-Haider, Deputy Director, Department of Environment, Bangladesh, followed by remarks from Mr Alex Owusu-Biney, Portfolio Manager of UNEP-GEF Biosafety Project, Division of Environmental Policy Implementation, UNEP. Dr. Ranjini

Warrier, Adviser, MoEFCC and National Project Coordinator of the ongoing Phase II Capacity Building Project on Biosafety in India led the Indian delegation to the meeting. The agenda of the meeting included discussions on the progress of projects being implemented in India, Bangladesh and Cambodia and on going developments under Cartagena Protocol on Biosafety. Dr. Ranjini Warrier made a detailed presentation covering activities and achievements on various components of the project in India, which were highly appreciated by UNEP. Dr. Warrier agreed to share the outputs from the project with the regional partners. The participants were also provided training on the use of ANUBIS as the project management tool.



Consultative Meetings for the Third National Report on the Implementation of the Cartagena Protocol on Biosafety



Conference of Parties serving as the Meeting of Parties (COP-MOP). He further indicated that the next COP-MOP is scheduled to be held in December 2016 at Mexico and hence National Reports will be finalized by the CBD Secretariat by December 2015. Dr. Hota provided information to the participants on the status of compliance by India and the draft responses in the text of the Third National Report. He informed that the format of the third National Report consists of 208 questions that include some of the questions same as in second national report and new ones based on indicators of the Strategic Plan for the CPB for the period 2011-2020. The participants deliberated on various sections of the report and provided their response. The text of the report was modified based on the suggestions of participants after each meeting and circulated to wide range of stakeholders. The report was submitted online on the scheduled date of submission i.e. October 31, 2015.

MoEF&CC organized a series of consultative meetings to discuss and finalize the Third National Report on the Implementation of the Cartagena Protocol on Biosafety in October 2015. These meetings were chaired by Shri Hem Pande, Special Secretary, MoEF&CC and National Focal Point on CPB and was attended by more than 50 participants representing various stakeholders including concerned ministries, enforcement agencies and experts. Shri Pande informed the participants that as per the Article 33 of the Cartagena Protocol on Biosafety (CPB), each Party is required to submit national reports on the status of implementation of the CPB in their countries on a four yearly basis to help monitor and review the status of implementation of CPB. Shri Hem Pande also informed that the first internationally recognized certificate of compliance under the Nagoya Protocol on Access and Benefit Sharing (ABS) has recently been given to India as a recognition for its efforts to comply with the international treaties.

Dr Manoranjan Hota, Advisor, MoEF&CC gave a brief background about CPB and India's status of compliance under the various articles. He informed that National Report is submitted at least one year before the next meeting of the



AD HOC TECHNICAL EXPERT GROUP ON SYNTHETIC BIOLOGY

The Secretariat to the Convention on Biological Diversity (SCBD) has established an Ad Hoc Technical Expert Group (AHTEG) on Synthetic Biology in pursuant to decision XII/24 on 'New and Emerging Issues- Synthetic Biology' taken at the twelfth meeting of Conference of Parties to the CBD held at Republic of Korea in 2014. The AHTEG on synthetic biology is aimed to help develop clarity of relationship between synthetic biology and biological diversity as per the three objectives of CBD i.e., to ensure the conservation of biological diversity, the sustainable use of its components and the equitable sharing of the benefits arising out of the utilization of genetic resources.

On basis of the information collected through series of online discussions from April to July 2015 via the open ended forum, the AHTEG is expected to examine the following issues:

- How to address the relationship between synthetic biology and biological diversity
- Similarities and differences between living modified organisms (as defined in Cartagena Protocol on Biosafety) and organisms, components and products of synthetic biology techniques
- Operational definition of synthetic biology, comprising inclusion and exclusion criteria
- Potential benefits and risks of organisms, components and products arising from synthetic biology techniques to the conservation and sustainable use of biodiversity and related human health and socio-economic impacts relevant to the mandate of the CBD and its Protocols
- Best practices on risk assessment and monitoring regimes currently used by the Parties to the CBD and other Governments
- Adequacy of existing national, regional and/or international instruments to regulate the organisms, components or products derived from synthetic biology techniques
- Degree to which the existing arrangements constitute a comprehensive framework in order to address impacts of organisms, components and products resulting from synthetic biology, in particular threats of significant reduction or loss of biological diversity

The AHTEG would report its work to the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) of the COP, prior to the thirteen meeting of COP in 2016.

Online Discussions on Various Documents for Risk Assessment and Risk Management of Living Modified Organisms

An Ad Hoc Technical Expert Group (AHTEG) on risk assessment and risk management is working on finalizing a series of documents for guidance on risk assessment and risk management of living modified organisms (LMOs). A roadmap and guidance document was prepared by the AHTEG which was discussed in the conference of Parties serving as meeting of Parties (COP-MOP 7) to the Cartagena Protocol on Biosafety and the Parties were advised to further test the guidance on risk assessment and risk management of LMOs.

A series of activities are underway to give inputs prior to the eighth meeting of the COP-MOP scheduled in December 2016 at Cancun, Mexico. These include online discussions, where stakeholders can participate. Two rounds of online discussions in near future include:

- **Feb 1-15, 2016: Submission of views, relevant guidance and sources of information on**
 - centres of origin, genetic diversity and unmanaged ecosystems,
 - human health,
 - RNAi and dsRNA,
 - synergistic effects of herbicides part of LMO technology packages
- **Feb 22-29, 2016 : Submission of views, relevant guidance and sources of information on LM fish**

These online discussions can be viewed at :

http://bch.cbd.int/onlineconferences/onlineconferences/forum_ra/discussion.shtml

Biosafety Resource Kit for Genetically Engineered (GE) Plants

A Biosafety Resource Kit for Genetically Engineered (GE) Plants has been developed by the Ministry of Environment, Forest and Climate Change in association with Biotech Consortium India Limited. The Biosafety Resource Kit consisting of five brochures which was released by Shri Hem Pande, Special Secretary, MoEF&CC and National Project Director, Phase II Capacity Building Project on Biosafety at September 15-17, 2015 in New Delhi and at the 3rd Annual South Asia Biosafety Conference held in Dhaka, Bangladesh on September 19-20, 2015

The Biosafety Resource Kit has been prepared with an objective to promote public understanding about biotechnology and biosafety by information dissemination. The kit consists of the following five brochures:



S. No.	Brouchure	What covers
1.	Cartagena Protocol on Biosafety: An Overview	A comprehensive overview of the Cartagena Protocol on Biosafety (CPB) to facilitate easier understanding of its key provisions and obligations among biosafety stakeholders
2.	Regulatory Frame-work for GE Plants in India	An overview of the biosafety regulatory framework for GE plants in India with view to facilitate easy understanding of the key provisions of various Acts, Rules, Guidelines and Sectoral Policies among various stakeholders
3.	Frequently Asked Questions about GE Plants	Some of the basic information about genetic engineering, GE plant and its development, safety assessment and current status of GE plants with a view to enhance awareness on the technology and facilitate information sharing among various stakeholders.
4.	Confined Field Trials of GE Plants	An overview of the concepts and scientific principles of reproductive isolation and other effective risk mitigative measures adopted to minimize adverse impacts on the environment during confined field trials. In addition the brochure also introduces the role that such trials play in both the product development pipeline and the regulatory review process.
5.	Useful Resources for Safety Assessment of GMOs	Brings together the information online databases and information resources of particular relevance to the biosafety of GE plants, giving a brief description of their content and objective with a view to facilitate information sharing among various stakeholders.

Monitoring Confined Field Trials of Regulated Genetically Engineered Plants: A Manual and Tools for Trainers

A manual and a tools for trainers on monitoring of confined field trials of genetically engineered (GE) plants has been developed by the Ministry of Environment, Forest and Climate Change as an outcome of thrust area on risk assessment and risk management of the phase II capacity building project on biosafety. These documents have been developed for strengthening the capacities of researchers, developers and regulators for conducting field trials of GE plants in a scientific manner.

Shri Hem Pande, Special Secretary, MoEF&CC and National Project Director, phase II capacity building project on biosafety released these documents at the 3rd Annual South Asia Biosafety Conference held in Dhaka, Bangladesh on September 19-20, 2015.

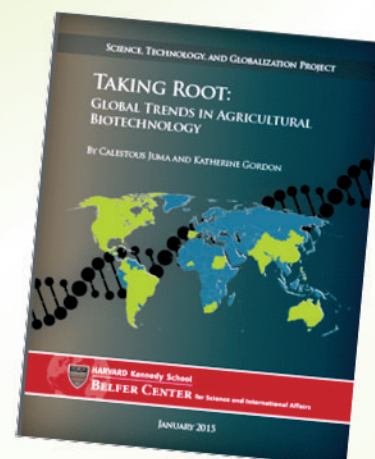
Monitoring best practices to be followed at every stage of conducting field trials including scientific basis for confinement, process of monitoring and assessing risks and suggestions for corrective measures for managing trials are outlined in the monitoring manual. The tools for trainers broadly covers: (1) Preparing and delivering a training workshop, (2) Presentations and group exercises (3) Group exercise with answer key and notes, along with the quiz and post workshop questionnaire. These documents will help enhance the awareness on conduct of GM crop field trials and create a pool of trained resource persons.





Taking Root: Global Trends in Agricultural Biotechnology

A paper on "Taking Root: Global Trends in Agricultural Biotechnology" has been released by the Belfer Center for Science and International Affairs at Harvard University, USA. The paper authored by Calestous Juma and Katherine Gordon, Director and Project Coordinator, respectively, of the Science, Technology, and Globalization Project, reviews the evidence on global trends in the application of agricultural biotechnology and identifies some of their important benefits. It has been indicated that transgenic crops show significant societal benefits, including positive economic impact, fostering food security and promoting environmental sustainability. The paper recognizes that biotechnology alone cannot solve the world's agricultural challenge and though it is not a silver bullet, it should still be included in the package of technological options available to farmers. Transgenic crops in development have been listed to include those with enhanced photosynthesis, stress tolerance, aluminum tolerance, salinity tolerance, pest and disease resistance, nitrogen use efficiency, phosphate use efficiency, and nitrogen fixation. The authors have noted that transgenic crops have recorded the fastest adoption rate of any crop technology in the last century, mainly because they confer benefits to farmers, most of whom reside in developing countries, yet, restrictive regulations on such crops are undermining the ability of society to reap their benefits.



The Global Pipeline of GM crops: an outlook for 2020

A 2008 Joint Research Centre (JRC) study that analyzed the global pipeline of genetically modified (GM) crops that were expected in the market in 2015, has been updated by the researchers at the JRC of the European Commission. The paper, published in Nature Biotechnology, describes GM crops in the pipeline from 2008 to 2014, presents the worldwide pipeline of genetically modified (GM) crops that are likely to be commercialized and cultivated by farmers in the short to medium term. Particular attention has been given to the 2020 outlook of new crops and traits, with a special focus on new quality traits (like e.g. for nutrition enhancement) and plants and traits developed for the emerging Bioeconomy sector. The database has been built by collecting information about the status of GM crops both in the regulatory pipeline of national biotechnology agencies and in the advanced phase of development by technology providers.

The study authored by Claudia Parisi, Pascal Tillie and Emilio Rodriguez-Cerezo also analyzes the role of developing countries in the GM crop pipeline. The paper indicated that, although a few arable crops (for feed and industrial use) and agronomic traits will likely dominate commercial varieties for the foreseeable future, with many being stacked together, more quality traits and specialty crops are being introduced into the pipeline. It has also been indicated that new technology developers are emerging, particularly in developing countries such as India, China, Brazil, and African developers are showing their willingness to enter the commercial field.

This article can be accessed at <http://www.nature.com/nbt/journal/v34/n1/full/nbt.3449.html>.

Publications by OECD

The Organisation for Economic Co-operation and Development (OECD) recently published three consensus documents containing information for use during the regulatory risk assessment of products of modern biotechnology. These documents help provide harmonisation for regulatory decisions among the OECD member countries.

- Biology of Cowpea (*Vigna unguiculata*):
- Biology of Common Bean (*Phaseolus vulgaris*)
- Compositional Considerations for New Varieties of Common Bean (*Phaseolus vulgaris*)

The crop specific consensus biology documents published by OECD provide comprehensive information on the biology and ecology of the plant. They are structured to include general description, taxonomy, geographic origin & distribution, reproductive biology, genetics, hybridization & introgression and health considerations. The document on compositional consideration provides basic information useful in risk/safety assessment of food and feed using new varieties of plants, background, compositional considerations, key constituents (nutrients, anti-nutrients, and others).

The paper is available for download at <http://belfercenter.ksg.harvard.edu/files/TakingRoot.pdf>.

Upcoming Events

Title	Organized/Hosted by	Date & Venue	Website
National Events			
ICAR Sponsored Winter School on Marker free transgenics and methods of transgene detection	ICAR-National Research Centre on Plant Biotechnology	February 1-21, 2016, New Delhi	http://www.nrcpb.org/sites/default/files/Brochure_winter%20school.pdf
National Conference on "Genetics and Cytogenetics"	University Of Agricultural Sciences, Dharwad and Dr. S.W. Mensinkai Memorial Education And Research Foundation (R)	February 1-3, 2016, UAS, Dharwad	http://www.uasd.edu/
Fourth National Symposium on Transforming Indian Agriculture towards Food And Nutritional Security	The Society of Agricultural Professionals C.S. Azad University of Agriculture & Technology, Kanpur	February 20-21, 2016	http://www.csauk.ac.in/announcement.html
Advanced Training on "Recent Advances In Improvement of Vegetable Crops"	Dr. Y.S. Parmar University of Horticulture & Forestry Nauni-Solan	Feb. 17 - March 8, 2016, Solan, Himachal Pradesh	http://www.yspuniversity.ac.in/trainings/caft-brochure-16.pdf
National Symposium On Transgenic Crops in India: Progress and Challenges	Department of Molecular Biology, Biotechnology & Bioinformatics, CCS Haryana Agricultural University, Hisar-125004 & Society for Plant Biochemistry and Biotechnology, New Delhi	March 16-17, 2016, Hisar, Haryana	http://www.hau.ernet.in/hisar_admin/news/pdf/1457174801symbbf.pdf
National Symposium on Biotechnology in Crop Improvement: Prospects & Challenges	Zakir Husain Delhi College (University of Delhi)	April 1, 2016, New Delhi	-
ISMPP 37th Annual Conference & National Symposium on Food Security through Plant Health Protection	Rajendra Agricultural University, Samastipur, Bihar and Indian Society of Mycology and Plant Pathology	April 4-6, 2016, Samastipur, Bihar	http://www.pusavarsity.org.in/wp-content/uploads/2014/08/ISMPP_37th_Annual_Conference_Final_Brochure.pdf
International Symposium on Management of Rice based agricultural system under stress prone environment at	Rajendra Agricultural University, Samastipur, Bihar	March 17-19, 2016, Samastipur, Bihar	http://www.pusavarsity.org.in/wp-content/uploads/2016/02/brochure.pdf
International Conference on "Pulses for Nutritional Security and Agricultural Sustainability"	Indian Society of Pulse Research and Development in association with Indian Institute of Pulses research, Kanpur	November 12-14, 2016, New Delhi	http://www.iipr.res.in/pdf/events_201115.pdf
International Events			
4th Biotechnology World Congress	Eureka Science and University of Sharja	February 15 - 18, 2016, Sharjah, UAE	http://biotechworldcongress.com/index.php
International Symposium on "The Role of Agricultural Biotechnologies in Sustainable Food Systems and Nutrition"	Food and Agriculture Organization	February 15-17, 2016, Rome, Italy	http://www.fao.org/about/meetings/agribiotech-symposium/en/
Regional Workshop for Sharing on Experiences in Risk Assessment and Risk Management	Ministry of Environment, Forest and Climate Change	April 4-8, 2016, Hyderabad, India	By invitation
3rd Plant Genomics Congress: Asia	Global Engage	April 11-12, 2016, Kuala Lumpur, Malaysia	http://www.globalengage.co.uk/plantgenomicsasia.html
BIO International Convention	Biotechnology Innovation Organization	June 6-9, 2016, San Francisco, CA, USA	http://convention.bio.org/
4th Annual South Asia Biosafety Conference	South Asia Biosafety Programme, ILSI Research Foundation and Biotech Consortium India Limited	September 19-21, 2016, Hyderabad	http://sabc.biotech.co.in/

Editor

Shri Hem Pande

Special Secretary, MoEFCC

Editorial Board

Dr. Ranjini Warriar

Advisor, MoEFCC

Dr. K. V. Prabhu

Joint Director (Research), IARI

Dr. Ravi Khetarpal

Regional Director, CABI - South Asia

Dr. Vibha Ahuja

Chief General Manager, BCIL

For feedback please contact :

Dr. Ranjini Warriar, Advisor

Ministry of Environment, Forest and Climate Change (MoEFCC)
Indira Paryavaran Bhawan, Jor Bagh Road, Aliganj, New Delhi - 110003
Phones : +91 (011) 24695246, E-mail : warrier@nic.in

Dr. Vibha Ahuja, Chief General Manager

Biotech Consortium India Limited

V Floor, Anuvrat Bhawan, 210, Deen Dayal Upadhyaya Marg
New Delhi - 110002, Phones: +91 (011) 23219064-67

Fax : +91(011) 23219063, E-mail : vibhaahuja@biotech.co.in vibhaahuja.bcil@nic.in

Disclaimer : The information in this newsletter has been compiled from various sources and does not necessarily depict views of the Ministry of Environment, Forest and Climate Change, Government of India.